

National Health Manuals

INFANCY

EDITED BY

T. N. KELYNACK, M.D.

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NATIONAL HEALTH MANUALS

INFANCY

EDITED BY

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PREFACE

THE NATIONAL HEALTH MANUALS, of which this is the first, are intended to afford concise and up-to-date scientific presentation of the principles and practices which guide and govern the establishment and maintenance of personal, domestic, and national health.

Each volume deals with a special aspect of hygiene. In order to ensure the most reliable and helpful treatment of the subjects selected, the preparation of each chapter has been allocated to a recognized *medical* expert.

As far as possible, technical phraseology has been avoided. It is hoped that both in arrangement and in substance these handbooks will be suited to the requirements of all thoughtful men and women.

For those working in connexion with Social Service organizations, Guilds of Help, Reading and Study Circles, and similar associations, and, indeed, for all striving for social betterment, these volumes aim at providing trustworthy guidance. In order that they may afford practical assistance, appendices have been added giving select bibliographies of publications suitable for reference and study, together with directions

PREFACE

and suggestions likely to be serviceable to serious students.

We are still in the experimental stage in regard to most matters relating to individual improvement and national welfare, and there is a danger that in our eagerness and enthusiasm to initiate and conduct new movements we may be led into errors and be betrayed into extravagances which must inevitably hinder progress. Social advance must be securely based upon and governed by scientific principles. To indicate and to explain these is the main purpose of these manuals.

The present volume deals with all aspects of Infant Life. Each writer has been granted a free hand in dealing with his or her particular subject, and is, of course, responsible only for the chapter contributed.

To all who have so generously co-operated in the production of this book unbounded thanks are due.

T. N. KELYNACK.

133 HARLEY STREET,
LONDON, W.

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I
INFANCY:
AN INTRODUCTION
THE EDITOR

*Get wisdom : and with all thy getting
get understanding.*

THE BOOK OF PROVERBS.

The people perish for lack of knowledge.

REPORT OF THE COMMITTEE
ON PHYSICAL DETERIORATION.

*Perhaps nothing will so much hasten
the time when body and mind will both be
adequately cared for as a diffusion of the
belief that the preservation of health is a
duty.*

HERBERT SPENCER.

*I will not cease from mental fight
Nor shall my sword sleep in my hand
Till we have built Jerusalem
In England's green and pleasant land.*

WILLIAM BLAKE.

*These things shall be / a loftier race
Than e'er the world hath known shall rise,
With flame of freedom in their souls
And light of knowledge in their eyes.*

*New arts shall bloom of loftier mould,
And mightier music thrill the skies,
And every life shall be a song,
When all the earth is paradise.*

J. ADDINGTON SYMONDS.

I

INFANCY AN INTRODUCTION

'THERE is no Wealth but Life,' is the great truth which Ruskin has revealed to all students of social progress. Our national treasure is hidden in life's beginnings. The wisdom and wealth of the future lie in the cradle of infancy. All designs for human betterment should begin with the infant. The records regarding infant births, mortality, and morbidity, afford reliable data whereby to gauge the efficiency of a people. The statistics relating to this country are startling. The Registrar-General shows that : 'If a comparison is made among European countries, it is found that in the years 1880-2 there were no fewer than six States in which the fertility of wives was less than that recorded in England and Wales, whereas twenty years later (1900-2) the rate of fertility among married women in England and Wales was, with the exception of France, lower than that recorded in any other European country.' Great Britain and some of her Colonies are adopting a policy which is slowly making for social and national suicide.

But while the birth-rate is falling, and the general death-rate is still declining, the infant mortality rate shows but little improvement. 'Children under twelve months of age die in England to-day, in spite of all our boasted progress, and in spite of an immense improvement in the social and physical life of the people, as greatly as they did seventy years ago.'¹

¹ NEWMAN, G. : *Infant Mortality: A Social Problem*. London : Methuen & Co. 1906. 7s. 6d. net.

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'The mortality rate is so high during the first week, that, were it to continue at the same figure for forty-two weeks, every infant born alive would have succumbed within such period.'¹

The following table indicates the high death-rate among infants as compared with the mortality in childhood.

*Table indicating Mortality Rate among Children under 15 years of age (males and females), in England and Wales, 1907.*²

Cause of Death.	Deaths under one year of age per 1,000 births.	Death Rate per 1,000 Living.			
		1-5 years.	5-10 years.	10-15 years.	All Ages.
All Causes . . .	117·62	17·58	3·37	1·97	15·00
Premature Birth and Congenital Defects .	26·45	0·08	0·01	0·01	0·18
Bronchitis and Pneumonia . . .	23·26	4·76	0·38	0·14	2·55
Atrophy . . .	15·01	0·22	0·00	0·00	0·42
Diarrhoeal Diseases .	14·06	0·94	0·07	0·03	0·57
Convulsions . . .	11·06	0·42	0·02	0·00	0·33
Whooping Cough . .	5·16	1·65	0·08	0·00	0·29
Measles . . .	3·00	2·85	0·22	0·01	0·36
Phthisis . . .	0·40	0·28	0·16	0·26	1·14
Other forms of Tuberculosis . . .	4·14	1·60	0·49	0·29	0·47
Diphtheria . . .	0·30	1·06	0·52	0·09	0·17
Diseases of Heart and Blood Vessels . .	0·04	0·08	0·13	0·23	2·34
All other Causes . .	14·74	3·64	1·29	0·91	6·18

'0·00' indicates that the deaths were too few to give a rate of 0·005 per 1,000.

¹ HEATH, H. L. : *The Infant, the Parent, and the State : A Social Study and Review*. London : P. S. King & Son. 1907. 3s. 6d. net.

² From DR. GEORGE NEWMAN'S Presidential Address at the Child Study Section of the Health Congress, Leeds, 1909. *Journal of the Royal Sanitary Institute*, 90 Buckingham Palace Road, S.W. Vol. XXX, No. 10. November, 1909.

INFANCY: AN INTRODUCTION

But it is well to remember that 'the magnitude of the loss by death is also an index of the amount of harm inflicted on the living.'¹

The numbers of the dead are but a fraction of those who are wounded. The most important year of a human being's life is the first year. If that be mismanaged, irreparable loss is the penalty. Permanent stunting, delicacy, and oftentimes crippling, result from a neglected infancy.

But the outlook is still more serious. The restriction in the birth-rate is most marked among the ranks from whom the best of the coming citizens might be expected to spring. Generally speaking, fertility is most conspicuous in those who are least likely to give birth to a healthy progeny, and whose conditions and habits of life are inimical to the highest and best functions of parentage. The propagation of the unfit proceeds almost unrestricted. Maternity is at a discount. The joys and responsibilities of parentage are deliberately denied. The claims and privileges and birth-rights of infancy, either through ignorance, apathy, or neglect, are being set aside. Liberty, luxury, and licence in the present threaten vital bankruptcy in the future.

But there are evidences of a reaction. Public attention is being concentrated on the infant. The child is coming into its kingdom. Many and varied experiments are being tried to meet the needs of the infant. Organizations of all kinds are springing into being. Educational influences are being brought to bear on all classes of the community. Legislative measures are endeavouring to make it easier to do right and more

¹ NIVEN, J.: *Special Report on Infantile Mortality, presented to the Council of the City of Manchester.* 1907.

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difficult to do wrong. Ethical instincts are aroused, and organized Christianity is supplying moral force to the social movement. The infant of the State can no longer be left as an outcast.

All this is to the good ; but in the multitude of counsellors there is not always safety. We need a wide outlook and discriminating wisdom. Each movement must be allotted its proper place. Everything must be done decently and in order. Scientific precision is essential. 'Broadly, it may be stated that Education comes first, active General Sanitation next, and those measures which the Notification of Births Act have made possible, which carry the help *to the home*, which tend to enable the mother herself to nurse her child *in her own home*, and which give assistance *there* at the proper time, come next, and all other agencies, however beneficent, should be placed in a different category altogether.'¹

In the present manual all aspects of Infancy have received consideration, and a combined effort has been made to present such facts and define such principles as shall both quicken the conscience and awaken the intelligence of all sorts and conditions of thoughtful men and women, to the basal problem of Infancy in our social and national life.

¹ MOORE, S. G. H. : *Report on Infantile Mortality, presented to the Council of the County Borough of Huddersfield*. Fourth edition. N.D. 2s. 6d.

II

THE ANATOMY AND PHYSIOLOGY OF THE INFANT

JOHN BENJAMIN HELLIER, M.D.

*Professor of Obstetrics in the University of
Leeds; Honorary Obstetric Physician to the
Leeds General Infirmary; Consulting Phy-
sician to the Leeds Maternity Hospital;
Author of 'Infancy and Infant Rearing'*

*The Childhood shows the man,
As morning shows the day.*

MILTON.

*No change in Childhood's early day,
No storm that raged, no thought that ran,
But leaves its track upon the clay
Which slowly hardens into man.*

ROMANES.

*The first requisite to success in life is
to be a good animal.*

HERBERT SPENCER.

*The very foundation of the whole com-
monwealth is the proper bringing up of the
young.*

CICERO.

*The errors of parents the gods turn to the
undoing of their children.*

EURIPIDES.

*Every action of every man has an an-
cestry and a posterity—an ancestry and a
posterity in other lives.*

HENRY DRUMMOND.

*The duty of each generation is to gather
up its inheritance from the past, and thus
to serve the present, and prepare better
things for the future.*

FROEBEL.

II

THE ANATOMY AND PHYSIOLOGY OF THE INFANT

WITHOUT a knowledge of certain facts concerning the structure and functions of the body in infancy it is impossible to provide for an intelligent management of this most important period of existence.

PRE-NATAL LIFE

It is necessary to remember that the human offspring is not born under ordinary circumstances until nine months old. For forty weeks the womb retains the developing infant and then expels it that it may begin an independent life. In this pre-natal period there are various possibilities of defective development. Actual disease may occur, and even prove fatal to the unborn child, so that its death may precede its birth. The art of rearing healthy infants must commence with the care of the expectant mother.

Infants born before the twenty-eighth week will almost certainly die at or shortly after birth. In proportion as the child is premature, so will it be found to be puny and deficient in vitality. An infant born before its time has difficulty in establishing such vital processes as breathing, swallowing, and the digestion of food, and

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especially in maintaining the proper temperature of the body.

SIGNS OF INFANT MATURITY

The new-born child should measure on the average 20 inches. It may vary from 19 inches to $21\frac{1}{2}$ inches. The average weight is 7 lb., rather more in males and a little less in females. Variations between 6 lb. and 8 lb. are, however, very common. A weight of 10 lb. is uncommon, and one of 12 lb. most exceptional. In twin births the weight of full-term children may fall much below the averages.

In a full-time baby the toe-nails should come well to the end of the toes, and the finger-nails should slightly overlap the ends of the fingers. There should be a fair amount of fat beneath the skin.

Premature children are shorter in stature and lighter in weight, averaging at seven months about 15 inches in length and 45 ounces in weight, and at eight months $16\frac{1}{2}$ inches and $4\frac{1}{2}$ to 5 lb. They are deficient in fat, and this gives them an old and wrinkled appearance. The skin is purplish and more or less covered with down; the cry is feeble; breathing and all muscular movements are weak; and there is great susceptibility to external cold.

THE ESTABLISHMENT OF NORMAL FUNCTIONS

Respiration.—When the infant is born it must begin to breathe or die. Life seems at this moment to hang by a slender thread; but in most cases respiration is established spontaneously with wonderful certainty. A vigorous cry indicates that the lungs are working

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properly. The respirations in the minute number at birth about 44; in the early months, 35 to 40; at the end of the first year, 29; in the third and fourth years, 25; while in the adult they average 16 to 18. Breathing during infancy is as a rule slower during sleep. Respiration in early life is 'abdominal' in type; that is to say, the rise and fall of the abdominal walls are relatively greater and the expansion of the chest relatively less than in adults. The healthy infant breathes quietly, and as it draws in its breath there should be no crowing sound, no great dilatation of the nostrils, and no sinking in at the pit of the stomach or above the breast-bone. The respirations are best estimated by placing the hand on the abdomen and counting for three consecutive minutes. Infants do not expectorate; they swallow any phlegm which is brought up into the mouth.

Circulation.—Important changes take place in the circulation at the time of birth, the principal one being the closure of the communication which exists during intra-uterine life between the two auricles of the heart. When this closure has failed to take place, as is occasionally the case, the skin assumes a permanent bluish tinge and the child is most seriously handicapped in the struggle for existence, and usually dies early.

The pulse in infants is much more variable than in adults. Its rate is easily disturbed. Crying, for instance, will send it up ten or twenty beats, and sucking also will accelerate it. If there is difficulty in counting the pulse at the wrist, enumerate the heart-beats. During the first month of life the rate of the pulse varies from 120 to 140. The average for the first two months is 137 (Trousseau); from the second to the sixth month, 128; from the sixth to the twelfth, 120; from the twelfth to the

THE ANATOMY AND PHYSIOLOGY

twenty-first, 118; in the second year, about 110; from the third to the sixth year, 91 to 110.

The temperature of an infant, taken with a thermometer in the rectum, gives indications of great value. The rectal temperature at birth is 100° F. It then rapidly falls about three degrees, falling most in infants who are weak or who breathe imperfectly. The normal standard during infancy is 98·8° F. to 99° F. The temperature in infancy is more variable than in adults. It is lowest in the small hours of the morning, and highest at about six p.m. The range of daily variation may be from 2° F. (Findlayson) to 1·2° F. (Sturges). A sudden rise of temperature is much less alarming in an infant than in an adult, and from a given cause the temperature will rise higher in the child. Infants easily lose heat by the skin, and cannot stand the exposure of large tracts of skin to cold air. This is one of the reasons why there is a heavy mortality in infancy from chest diseases.

DIGESTIVE FUNCTIONS

Every one knows that a young infant cannot walk or speak, but many fail to realize that most of the internal functions are in a similiar rudimentary condition. Many an infant dies because its stomach has been filled with material which it is powerless to digest.

The stomach of an infant is but of small capacity. At birth it will contain about 1 fluid oz. ; at the end of one month, 1½ fluid oz. ; at the end of a year 7 fluid oz. ; in fourteen or fifteen months ½ pint. When an infant's stomach is overfull the contents return, so that a certain amount of regurgitation is natural to infants.

Starchy foods, such as bread, biscuits, and potato, cannot be digested properly during the first six months of

OF THE INFANT

life. This is due to the fact that the saliva and the pancreatic juice, which have the function of preparing starch for digestion by converting it into grape sugar, are at this time scanty in amount and deficient in chemical action. It is of the utmost importance that the unsuitability of starchy foods in early infancy should be borne in mind. On the other hand, fatty foods are usually well digested by healthy young infants. They take cream well, and some will even drink cod-liver oil with obvious relish. Infants should not be given *meat* and other solid food, because they are without teeth wherewith to grind the food to pulp; the walls of the stomach and intestine are weak and not equal to the vigorous movements which are necessary for the onward propulsion of the more solid food, and the digestive juices are scanty in quantity and feeble in action. Infants are, however, able to absorb the juice of meat.

The stomach digests milk by first curdling it and then rendering the curd soluble (peptonizing). If this be too hard to digest it will be passed in undigested masses in the motions. Dilution of the milk often aids its digestion.

EXCRETIONS

The faeces.—The motions of the new-born child consist for the first three or four days of nearly pure dark bile, called meconium. They then become bright yellow, almost odourless, and semi-fluid in consistency. Should they become green, putty-like, very white, or offensive, or should they contain mucus, blood, or much undigested food, they are abnormal. Towards the end of the second year the motions become formed, and have the consistence, colour, and odour observed in adults.

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Urine.—An infant passes relatively more urine than an adult, but the difficulty of measuring the amount at first is obvious. In the first month less than $\frac{1}{2}$ pint is passed daily; after that about $\frac{3}{4}$ pint daily in the first year; about 1 pint daily by the end of the second. The urine should have little odour, and should not stain linen. The specific gravity is low.

Perspiration.—There is but little perspiration for the first few weeks. But children may perspire freely if too warmly dressed. Rickety children sweat very much from the head. If the breathing be obstructed by lung diseases there is much perspiration.

THE BONY SYSTEM

At birth the infant has not a fully solidified bone in its whole body. The skeleton appears complete as to form, but consists chiefly of cartilage or gristle, which could be bent or cut with a knife. In a healthy child, placed in healthy environment, and fed on proper food, the ossification or bone-formation advances rapidly, but under adverse conditions ossification is defective, and the child has soft bones, which bend or are otherwise misshapen. This is especially the case in rickets.

Ossification begins at more than one point in each bone: these points are called *centres of ossification*. When the ossified parts are all fused together, the bone is complete; but in some of the bones this does not occur until adult age. The ends of the long bones are called epiphyses, and they ossify separately. In rickets the epiphyses become swollen, and cause swellings above the joints which are characteristic of this disease.

At the top of the head in the infant is a spot where the bones do not meet, and where, through the mem-

OF THE INFANT

brane, the soft brain can be felt with pulsations caused by the blood-vessels. This is called the *fontanelle*. Another smaller and less obvious is situated at the back of the head. In two years the fontanelles should be completely closed. In rickets the larger fontanelle remains unclosed beyond the normal period.

THE NERVOUS SYSTEM

Motor functions.—The movements of the new-born child are almost entirely automatic. The heart beats, the respiratory act goes on, the bladder and bowels empty themselves. The infant can suck and swallow, can move the limbs and cling with the hands, but cannot raise the head. The movements of the limbs begin before birth, and are more or less active from birth, and at the end of two months have considerable vigour and give the child obvious pleasure. A baby often smiles when the cheeks are touched, but this at first is chiefly reflex; at the end of two months the infant smiles when pleased. After three months a healthy infant should be able to seize things with the hand, and delights to put them to the mouth; and about this time attempts are made to raise the head. In the fourth month the infant has some power of retaining a sitting posture, and at six it can usually sit up and use playthings, while at eight it may begin to creep, and at nine or ten makes efforts to stand alone. At about eleven months a normal child should be able to walk with assistance; at twelve it can stand alone; and at fourteen or fifteen months, walk alone, showing also great control over the hand-movements, and turning the head at every sound.

Sensory functions.—Ordinary sensation in the skin is present from birth. Infants are said to be born deaf,

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but they soon show sensitiveness to loud, shrill sounds, and may evince distinct pleasure when one or two months old at music : at six months most babies like to be sung to. Children delight in such noises as are usually torture to adults.

The sense of *taste* is probably active from birth, and a hand-fed infant early shows likes and dislikes in regard to flavours.

Smell is not an active sense at first, and discrimination of odours is a late acquirement.

The faculty of *vision* is a complicated acquirement. It involves not only the perception of light and dark and the discrimination of colours, but the recognition of shape and outline, and the judgement of distance ; and consequently it takes a long time to learn to see rationally. At first there is a diffuse sense of light, and any bright object attracts the child. For two months the eyes may fail to move together, and squinting often occurs. The child will try to grasp any bright object, however distant, showing that judgement of distance is imperfect. In six months a baby begins to recognize people. The colours red and yellow may be distinguished in the first year, and green and blue in the second. Occasionally an individual never acquires the power of distinguishing colours, and remains colour blind.

Speech.—Towards the end of the first year the child will be able to use one or more articulate sounds intelligently. The open vowel sound, *ah* ! is the first vowel produced, and the labials *m*, *p*, and *b* are the first consonants to be used. At eighteen months several words will be in use, and at the end of the second year a few phrases. Some healthy children are late in speaking, without any mental defect, or subsequent detriment.

OF THE INFANT

TEETHING

The first set of teeth are called *deciduous* or milk-teeth, because they are shed subsequently to be replaced by the permanent teeth. The deciduous teeth are twenty in number, each half of each jaw containing five, namely, two incisors, one canine tooth (also called eye-teeth from the mistaken notion that they have some special relation with the eye), and two pre-molars. We quote Tarnier's account of the way in which the teeth are cut, although there are many exceptions in the order observed: 'The milk-teeth appear in groups which are separated from one another by periods of rest. First come the two lower incisors, usually in the seventh or eighth month, but occasionally as early as the fourth. After an interval of six or eight weeks the two upper central incisors appear, one eight to fifteen days after the other. Somewhat later come the two upper lateral incisors, so that the child has four above and two below. At the commencement of the second year the two lower lateral incisors and the four first pre-molars appear, their eruption being spread over two months. Total, twelve teeth.

'At about the middle of the second year the four canine teeth take their place between the lateral incisors and first pre-molars, and toward the end of the second year the remaining four back teeth are cut. Exceptionally early eruption of teeth may be noticed. Great delay in teething is seen in rickets and very weakly infants.'

GROWTH IN WEIGHT AND STATURE

Systematic weighings are of great value in estimating the progress of the child, and in determining whether it is being properly fed and cared for. It is very useful to

THE ANATOMY AND PHYSIOLOGY

weigh the infant once a week during the first year, and once a month in the second and third, and so on. Such records are of special value in schools and public institutions. Weight charts may be employed.

An infant loses weight in the first three days of life, but recovers the birth-weight by the end of the first week. The average loss is from $5\frac{1}{2}$ to 7 oz. A child should double its birth-weight in five months, and treble it in twelve. But hand-fed babies do not gain so rapidly. During the second year the average child gains about 5 lb., and for the next six years the gain is about 4 lb. a year.

Table showing average weight at the end of each month during the first year of life. [Mean of observations by Bowditch and Fleischmann, Albrecht and Biedert.]

Month.	lb.	oz.	Month.	lb.	oz.
1	8	14	7	17	11
2	11	7	8	18	7
3	13	7	9	19	3
4	14	11	10	19	11
5	15	15	11	20	2
6	16	14	12	20	8

The growth in stature is given approximately in the following table (from Quetelet) :

Length at birth	19'15 to 20	inches.
„ at end of first month	about 20'5	„
„ „ second „	„ 21	„
„ „ third „	„ 22	„
„ „ fourth „	„ 23	„
„ „ fifth „	„ 23'5	„

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Length at end of sixth month	.	.	about 24	inches.
" " seventh "	.	.	" 24'5	"
" " eighth "	.	.	" 25	"
" " ninth "	.	.	" 25'5	"
" " tenth "	.	.	" 26	"
" " eleventh "	.	.	" 26'5	"
" " twelfth "	.	.	" 27	"
" " two years	.	.	" 30'5	"
" " three "	.	.	" 33	"
" " four "	.	.	" 35'5	"
" " five "	.	.	" 38	"

Although it is becoming customary to restrict the term infant to the suckling period or the first year, yet the designation is still used to include children of a somewhat older age. It may therefore be permissible to furnish here a short summary of development at the end of the second year under normal conditions. This will give the mother and nurse a sort of standard to aim at.

The child should weigh about 36 lb. and measure from 30 to 32 in. in length. There should be twenty teeth. The fontanelles should be closed. The child should be able to walk alone, the limbs being straight, the spine erect, and the chest well shaped. No beads should be present on the ribs, nor should the ends of the bones be swollen at the joints. The lungs should expand well, and there should be no wheezing or other abnormal sound in the chest. The child should not keep the mouth open constantly when awake or asleep. The flesh should be firm, and the face of a healthy colour. There should be no excessive sweating about the head, no tendency to bronchitis, croup, or convulsions, no undue prominence of the abdomen, and no enlargement of the glands in the neck or elsewhere. The bowels should act regularly once or twice daily, the motions

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being well formed and having the usual faecal odour. The child should possess a good appetite, should sleep well, and manifest great enjoyment in games and physical exercises. A healthy child of two years should be bright and lively, and able to say several words, and even utter a few phrases.

According to many the period of infancy may be said to end with the completion of the first dentition.

It is of interest and importance to note the relative size of the head and chest in infancy and childhood. The head is too large in hydrocephalus and rickets, and too small in cases of defective brain development and idiocy. The following table relating to children of good development is quoted from Keating's *Cyclopædia of the Diseases of Children*, and based upon observations by Dr. James Whitehead of Manchester :

No. of cases observed.	Age.	Girth of head in inches.	Girth of chest in inches.	Difference between Head and Chest.
100	1 day	13'75	12'94	Head more than chest 0'81
66	6 to 12 weeks	15'25	14'25	" " " 1'00
75	6 " 8 months	16'68	15'58	" " " 1'10
71	11 " 13 "	17'80	17'20	" " " 0'60
67	21 " 24 "	18'38	17'85	" " " 0'53
50	34 " 36 "	18'70	18'61	" " " 0'09
60	4 " 4½ years	19'20	19'72	Chest more than head 0'52
46	6 " 6½ "	19'51	19'76	" " " 0'25
40	9 " 10 "	19'56	21'31	" " " 1'75
31	11 " 12 "	20'00	23'46	" " " 3'45

III

THE HYGIENE OF INFANCY

**SIR WILLIAM J. THOMPSON,
B.A., M.D., F.R.C.P.I.**

*Physician in Ordinary to the Lord-
Lieutenant of Ireland; Physician to
Jervis Street Hospital, Dublin; Con-
sulting Physician, National Hospital
or Consumption, Ireland*

*Sow an act, reap a habit ;
Sow a habit, reap a character ;
Sow a character, reap a destiny.*

THACKERAY.

*We must look to the Mothers of a country
for that country's welfare.*

FROEBEL.

*I acknowledge the all but Omnipotence of
early culture and nurture.*

CARLYLE.

*There is a sight all hearts beguiling,
A youthful mother to her infant smiling,
Who with spread arms and dancing feet,
And cooing voice, returns its answer sweet.*

JOANNA BAILLIE.

*Unless the average woman is a good
wife and good mother, unless she brings up
her children sound in soul and mind and
body—unless this is true of the average
woman, no brilliancy of genius, no material
prosperity, no triumphs of science and
industry, will avail to save the race from
ruin and death. The mother is the one
supreme asset of national life ; she is more
important by far than the successful states-
man or business man, or artist or scientist.*

THEODORE ROOSEVELT.

III

THE HYGIENE OF INFANCY

THE science of Hygiene, which aims at promoting health generally, is nowhere more important and far-reaching than when applied to infancy.

THE HYGIENIC PROTECTION OF INFANCY

Hygiene aims at, and labours for, the upbringing of a healthy and vigorous race. At the present time, when so much is heard regarding the deterioration of our national race, the hygienic protection of infancy is one of the most momentous sociological problems of the day. This branch of practical science relates to the care and proper treatment of infants as regards dietary, clothing, fresh air, exercise, healthy environment, and all pertaining to the wellbeing of the embryo citizen. The object of practical hygiene is to provide conditions making for a life strong and healthy, and capable of fullest development, into manhood or womanhood, with not only a sound body, but also a wholesome mind.

With a little care, forethought, and knowledge this is readily accomplished. If the ordinary simple rules of health are neglected, as has been so often the case in the past, and still is in the present, children will continue to grow up stunted and crippled, an anxiety to their

THE HYGIENE OF INFANCY

parents, dependents on a charitable public, and an intolerable burden to the State. Such lives form a more than useless part of the nation from an economic point of view.

THE WASTAGE OF INFANT LIFE

The existing deplorable sacrifice of the innocents, which is, one must affirm, mainly preventable, should be a matter of deep concern to the whole community. Life is strenuous ; competition keen ; the battle of life is stern ; it is a very serious drawback for a young man or a young woman to be launched on their career deficient in physique or lacking in mental equipment. To expect such to take a proper place in the life of the community, defective in body and deficient in mind, is, to say the least, a grave injustice. Our present policy and practice involve serious wastage of life, dissipation of energy and resource, not only for the individual, but for the home and the nation.

INFANT CARE AND PARENTAL RESPONSIBILITY

A great responsibility is placed on all parents. On them mainly depends as to how the infant shall develop. The importance of ante-natal conditions cannot be forgotten or neglected.

Thoughtful people are considering the underlying truths connected with the marriage problem. A discussion as to whether there should be any check or supervision by the State in order to limit the number of indiscriminate marriages, and unions of derelicts and decadents, hardly comes within the limits of this chapter. Of one thing all may be certain, and that is that parents

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cannot be allowed to shirk their responsibility for the proper upbringing of their children.

THE HYGIENE OF MOTHERHOOD

The health and strength of the baby at birth depends, in a great part, on the health of the mother, and the care taken during her pregnancy. Throughout this period she should, except there is some strong medical reason for doing otherwise, go about her ordinary duties as usual. She must not, on any account, rest too much, remain inactive, or avoid open-air exercise. In no respect must she pamper herself. She should, however, as far as possible, avoid mental strain, worry, anxiety, as well as all forms of undue excitement. The dietary should be plain, wholesome, and free from any kind of alcoholic beverage. The expectant mother should live as much as possible in the open air, and at night sleep in a large, airy, well-ventilated room. Her dress should be suitable for the season, and not too heavy or tight-fitting. The skin must be kept in a healthy condition by baths. Constipation should be avoided. Special attention should be given to the care of the teeth; they must be kept scrupulously clean. Should there be any symptoms of ill-health during the period of pregnancy, medical advice should be sought at once, as very often a slight disorder, corrected in time, means the avoidance of much trouble for both mother and baby, and it may be the prevention of serious accident or actual disease.

THE HYGIENIC MANAGEMENT OF BIRTH

In making preparations for the birth of the baby, all necessary hygienic considerations should be taken into

THE HYGIENE OF INFANCY

account. Everything used in connexion with the event should be scrupulously clean—the room, bed, clothes, patient, nurse, and attending doctor. The temperature of the lying-in room should be about 65° F. A cold apartment is to be avoided, for it must be borne in mind that a newly born babe is readily depressed by exposure to cold. Shortly after birth the infant should have its first bath. This should be of a temperature not less than 96° F., and not more than 100° F. In the winter, the bath should be given before a fire, all draughts being guarded against. There should be sufficient water to cover the infant. Not more than two or three minutes should be spent in giving the first bath. Drying should be done more by ‘dabbing’ with a soft towel than by rubbing, as the skin is delicate, and either hard rubbing or imperfect drying will be likely to cause abrasions. Before the bath, the nurse should thoroughly cleanse the eyes of the newly born infant with a weak antiseptic eye-wash, and see that no secretion or matter remain lodged under the eyelids. Fine and slightly antiseptic powder should, after drying, be dusted under the arm-pits, about the buttock, and into the folds of the groin.

When drying is finished, the infant is to be dressed ; this is usually commenced when baby is lying on its stomach, and a good nurse can get through this in a remarkably quick time, if clothes are provided of a proper shape and size. Particular attention must be paid to the dressing of the cord. It should be dusted with zinc oxide or boracic powder, inserted between a slit made in a small piece of antiseptic gauze which is folded up, and thus makes a pad. Clothing for an infant should be light and at the same time warm, as it is important

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that the young child should not be subjected to any sudden change of temperature. When the bathing and dressing are completed, the child should be thoroughly warm and comfortable, and ready for a long sleep. It should be put into its cot, and, except in the summer, a hot-water bottle should be provided.

THE HYGIENE OF THE NURSERY

The nursery ought to be one of the best rooms in the house, large, airy, well lighted, perfectly ventilated, and, above all, having a sunny southerly or westerly aspect. At least two or three times during the day the infant must be taken out of the nursery, and the door and windows thrown open to ensure a complete change of air. Many babies are now brought up with great advantage on an out-door existence, and even in winter a healthy infant should spend much of its day in the open air. The sanitary arrangements of the house should be in perfect order, for, if otherwise, the health of the mother and infant becomes affected, as no one can be in good health breathing impure air, and no one feels the effect of this sooner than a baby. The nursery above all other rooms should be kept absolutely clean. It should contain only such furniture as is necessary, and, should the infant be hand-fed, none of its food must be kept there.

THE DUTY OF MATERNAL NURSING

Every mother should do her utmost to nurse her offspring. Mother's milk is Nature's food for the infant, and every other substitute, however good, can only be

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counted as a second best. Breast feeding should take place every 2nd hour for the first month, then every $2\frac{1}{2}$ or 3 hours, and later on every 4 hours, and at night two feeds will be quite sufficient for a normal infant. After each feed the mother's nipples should be sponged with either plain sterilized water or a weak antiseptic lotion. On no account should the infant be suckled oftener than every 2 hours. To place a child to the breast every time it cries is a serious blunder. If so, its digestion is upset. Babies are creatures of habit, and the formation of good habits must begin at birth. By frequent irregular feeding fresh food is introduced into the stomach before the former meal is completely digested, with the result that there is a mixture of both digested and raw food. This leads to the formation of gas, dilatation of the stomach, undigested food in the motions, inflammatory conditions of stomach and bowels, and a host of other ailments unknown to a healthy infant. After each feed the child should be placed in its cot again and go off to sleep. A healthy infant's day is in this way made up principally in drinking and sleeping. After the first month a healthy child begins to keep awake longer, but, generally speaking, the more sleep an infant gets, the better. Quietness is essential for the developing infant. The nervous system of a newly born child is easily upset, and any noise, irritation, or excitement, will have a more serious effect on it than on a grown person. Very often some of the nervous symptoms which develop later on in life may be attributed to an excited babyhood.

When the weather is warm and genial, a baby can be taken out within the first week—at first for a short time twice or thrice daily, then for longer intervals, and later

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on, the longer the better, in fact all day, except when feeding. In the winter season the infant cannot usually be taken out quite so early, nor kept out so long; but it must not be housed all the time. It is undesirable to expose an infant to the sun's direct rays, or to strong and cold winds: a hooded perambulator provides protection from both.

SIGNS OF DISORDERED DEVELOPMENT

In a healthy and hygienically brought-up infant any deviation from normal health will speedily manifest itself. The child becomes irritable, sleeps badly, appetite is deranged, the motions are altered in character, and, instead of thriving, the infant actually loses weight. In many such cases the insistence on the maintenance of specific hygienic conditions, without any resort to physic or change of food, will readily lead to a restoration of health. Not only is it important to have good hygienic conditions carried out, as regards the person of the infant, but all those in attendance should also have a high standard of good health, and should have a special aptitude for dealing with young children. The nurse should have a good temper, she should be patient, affectionate, careful in carrying out details. It is undesirable to have a baby looked after by a weak and delicate nurse. A consumptive nursemaid should always be avoided.

THE HYGIENE OF LACTATION AND WEANING

A healthy mother should be able at least to give sufficient milk to her baby for six or seven months, and,

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when teething commences about the latter period, some additional food can often be given with advantage. This should at first be allowed but once a day, then twice daily, and so on until the baby takes the breast only at night. This prolongation of weaning has many advantages. Usually, at the end of the ninth or tenth month, the infant should be weaned completely. Once a child has got a number of teeth it is capable of digesting soft foods; these are to be gradually increased. During the time a mother is nursing her child she should endeavour to keep herself in as good health as possible. If not, the milk becomes of a poor quality, and the baby suffers. In addition to the mother taking proper food, she should also have ample exercise, fresh air, sufficient sleep, and complete freedom from anxiety and care.

Should there be any hereditary taint of alcoholism, syphilis, or tuberculosis, special care and precautions are to be adopted under skilled medical direction. If any symptoms indicative of serious disorder develop, medical aid should be requisitioned without delay. In fact, any baby with a bad family history should be kept under constant medical supervision.

NATIONAL ACTION FOR THE PROTECTION OF INFANCY

The Notification of Births Act now in force, which provides for the compulsory notification to the Public Health Authority, within a period of thirty-six or forty-eight hours, of the arrival of every new little citizen, will help much in the reduction of the high infant death-rate. The Medical Officer of Health of the district, on receiving such a report, can now, if he deems it necessary, send a nurse or properly trained health visitor to the

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home. It is the duty of such visitor to instruct the mother how to take care of the infant. Some, specially on the arrival of the first baby, know absolutely nothing of how to care either for themselves or their infants. With a little tact on the part of the visitor, both the health of the baby and mother may be protected. This is a department of work in which a properly trained and judicious health visitor is able to accomplish much, not only as regards the care and health of the infant, but also in a variety of other ways. Most people learn much more by seeing how a thing is done than by reading or listening to a lecture on the subject.

In the past, provision for the hygienic care of infants has been sadly neglected, with the result that certainly many useful, and probably brilliant, lives have been nipped in the bud, the proper increase of a healthy population checked, and many diseased and crippled children added to the community. At present there is a general awakening to a sense of responsibility in regard to this matter. Some practical steps are being taken to discharge this responsibility. In the future there can be no doubt but that very much more will be done in this direction and the abnormally high death-rate of infants materially reduced.

The Women's National Health Association of Ireland, established almost three years ago by Her Excellency the Countess of Aberdeen, has placed this—'the upbringing of a healthy and vigorous race'—as one of its definite purposes, and, although the infant death-rate in Ireland is much less than it is in England—only about 91 per 1,000 births—still, in the large towns and cities there is much room for educational work. This is being carried on by means of babies' clubs, pasteurised milk

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dépôts, and the like, and already much good has been accomplished.

Under our present social and economic conditions it would seem that for many of the nation's little citizens a hygienic infancy and childhood can only be rendered possible by the co-operation of parental, voluntary, and State efforts.

IV
THE FEEDING OF
INFANTS

**JAMES STEWART FOWLER,
M.D., F.R.C.P.E.**

*Physician, Royal Hospital for Sick
Children, Edinburgh; Joint Clinical
Lecturer on Diseases of Children,
University of Edinburgh; Author of
'Infant Feeding'*

*The only way to humanize cow's milk
is to pass it through the mother.*

JOHN F. J. SYKES.

*A woman rarely looks better—even the
plainest woman—than when she has a little
child clinging to her—her best adornment.*

KATHERINE BURRILL.

*O little soul, mysterious—new,
Fresh waked from God's eternal bliss,
Be near me, sweet ! At touch of thee
Again the Dawn-Wind breathes on me.*

O little soul.

MARY J. H. SKRINE.

*The ten fingers and toes, and the shell-like
nail on each,
The eyes blind as gems and the tongue at-
tempting speech ;
Impotent hands in my bosom, and yet they
shall wield the sword !
Drugged with slumber and milk, you wait
the day of the Lord.*

*Infant bridegroom, uncrowned king, un-
anointed priest,
Soldier, lover, explorer, I see you nuzzle
the breast.
You that grope in my bosom shall load the
ladies with rings,
You, that came forth through the doors, shall
burst the doors of kings.*

R. L. STEVENSON.

IV

THE FEEDING OF INFANTS

IN this chapter the principles on which the feeding of a healthy infant should be conducted will be considered. Indigestion and malnutrition are nearly always due to neglect of these principles, or to carelessness in carrying them into practice. When an infant is not thriving, medical advice should be obtained, and for this reason the diet of the sick infant will not be dealt with.

IMPORTANCE OF INTELLIGENT CARE

The baby whose mother both suckles him and attends to his wants intelligently, receives the best possible start in life. When the mother can nurse her infant, and even more when she is not able to do so, her character is one of the chief circumstances influencing his health. It is somewhat of a truism to point out the unenviable lot of the child of the drunkard, the slattern, or the foolish mother, but it is worth while emphasizing the great importance to a baby of intelligent 'mothering.' In some observations made by Park and Holt as to the effect of season, quality of milk-supply, and hygienic surroundings on the health of 652 babies dwelling in the slums of New York, this fact was strikingly brought out. The conclusion arrived at after most careful study

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of the facts was that the chief factor in securing good results is 'intelligent care.' Any systematic attempt to improve the health of the future generation ought to begin with the mothers, and must aim not merely at fitting them physically, but equipping them mentally for the task of child-rearing.

MOTHER'S MILK THE ONLY NATURAL FOOD

The milk of its mother is the only natural food for a young animal during the suckling period, and no perfect substitute can be prepared. Both everyday experience and the teachings of science prove the truth of this statement. During pre-natal life the offspring is obviously dependent on the mother, and though during the weeks and months which follow birth the dependence is less intimate, an organic connexion still subsists. The young kangaroo is born in a state of great immaturity—helpless, and incapable even of suckling. After birth it is received into the marsupial pouch and remains there permanently attached to the nipple for a considerable period, milk being pumped into its mouth by a special arrangement of muscles. The young of the higher (placental) mammals are less immature at birth, but for their proper development, particularly for the development of their digestive organs, Nature supplies each with a special milk. The milks of the woman and of the cow, for instance, differ from each other, and the differences exist in order to fit the stomachs of the young for dealing with the different foods on which as adults they will have to live.

In its mother's milk, too (particularly during the first few days after birth—the colostrum period), the newly

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born animal receives a number of substances which are very essential to its health. These are anti-bacterial substances, antigens, ferments, and the like. Further, the young animal which is suckled receives a food which is free from harmful micro-organisms. One of the chief dangers to which a newly born infant is exposed is infection of one kind or another. The most effective means of guarding against this is to supply a food which is sterile in itself, and which furnishes the infant with the defences it needs—in a word, mother's milk.

Human milk, therefore, surpasses all rivals in three respects: (1) Chemically, for its composition is specially adapted to the baby's needs; (2) Biologically, in supplying the ferments and antibodies which the infant lacks at birth; (3) Bacteriologically, in requiring no sterilization to render it harmless.

THE HYGIENE OF NATURAL FEEDING

In anticipation of the process of suckling, certain precautions should be taken during pregnancy. The mother ought to have plenty of ordinary nourishing food, and, generally, lead as healthy a life as possible. Corsets which compress the nipples should not be worn. If the nipples are flat and small an attempt should be made by daily manipulation to improve their shape. They should be washed regularly to remove secretion which may have exuded and dried on them, and they and the surrounding skin should be hardened by daily bathing with methylated spirits or eau de Cologne. Care of the nipples before and during lactation is of the first importance, because, next to absence of milk,

THE FEEDING OF INFANTS

fissured nipples are the most common cause of inability to nurse.

After the baby is born, he should be put to the breast within the first twelve hours of delivery, and should be reapplied at regular intervals of a few hours until the secretion of milk is established. One reason for giving the breast early is that at this time, before the breast is filled with milk, the nipple can be grasped more readily than when the breast is tense. Another reason is that we thus supply Nature's stimulus to the secretion of milk.

During the first twenty-four or forty-eight hours the baby does not obtain much from the breast, but unless he appears thirsty it is inadvisable to supplement his food. If he is restless and the secretion is scanty a little boiled water may be given. The milk secreted during the first few days after delivery is known as *colostrum*; it differs from the milk of the later stage of lactation in being rich in fat, in containing special structures known as colostrum corpuscles, in having a laxative action, and in being richer in antibodies. It is therefore of the greatest consequence to the infant that, whatever may happen later, he should be suckled at any rate during the early part of the puerperium. In order to promote the establishment of the mammary secretion the lying-in woman should have abundance of fluid, particularly gruel, and a generous diet. When once the flow of milk is fairly established its continuance can best be brought about by a liberal dietary, including plenty of milk, and by leading an ordinary healthy life. A nursing woman does not need alcohol, and ought not to take it in any form without the sanction of a doctor.

THE FEEDING OF INFANTS

As soon as lactation is fairly under way—say, towards the end of the first week—*regularity in feeding* should be insisted on. During the first six or eight weeks there should be ten nursings at intervals of two hours, during the period from the sixth to the tenth or twelfth week eight nursings at intervals of two and a half hours, during the rest of infancy six, and then five nursings at intervals of three hours. If necessary, the infant should be awakened when his meal-time comes round. The subjoined table shows the arrangement of feeds, the essential point being that adherence to these numbers and intervals ensures one longnight interval, which conduces equally to the comfort of the mother, the continuance of the supply of milk, and the health of the baby :

	A.M.	P.M.
10 2-hourly feeds .	6, 8, 10, 12, .	2, 4, 6, 8, 10, 12
8 $2\frac{1}{2}$ -hourly feeds .	6.30, 9, 11.30, .	2, 4.30, 7, 9.30, 12
6 3-hourly feeds .	7, 10, . . .	1, 4, 7, 10

After each nursing the nipples should be cleansed with a weak alkaline lotion (a pinch of bicarbonate of soda in a glass of water), and then dried with a soft towel. If fissures develop, medical advice is required. If they are neglected, the pain they cause will interfere with nursing, and will disturb the rest of the mother. They are also likely to allow pus-producing organisms (which cannot enter through unbroken skin) to gain access to the breast and set up mammary abscess.

It is usual to allow the infant to drink from the breasts alternately, and each nursing ought to last for from fifteen to twenty minutes. If the mother has enough milk and feeds the child at regular intervals it is almost certain that everything will go on well. Under

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ordinary circumstances the infant should have nothing except breast-milk for from seven to nine months, but it is inadvisable to protract lactation beyond this.

Normally, the baby should be weaned at about the eighth month. If the weather is very hot, or if diarrhoea is epidemic, weaning should be postponed to a more favourable opportunity. The child should be taken from the breast by degrees, the nursings being replaced one by one by feeds of cow's milk, prepared as will be described later. The whole process of weaning may extend over three or four weeks.

A baby ought never to be weaned prematurely except by order of a doctor. The mother's milk very rarely indeed disagrees with her infant; indigestion in a suckling is usually due either to irregular (particularly too frequent) feeding, or to the fact that some additional food is being given. So far as the child is concerned, practically the only reason for premature weaning is failure to gain weight.

Weaning may become necessary on account of the mother's health. Any serious disease contra-indicates nursing. This is especially true of pulmonary tuberculosis. When one breast becomes inflamed it is not advisable to nurse the baby on the other, because suckling stimulates both breasts to secrete. During lactation the menses as a rule remain absent, but a return of the periods does not necessitate weaning. When a nursing woman becomes pregnant her infant should be weaned. Acute illness of short duration, such as sore throat or influenza, does not necessitate the removal of the infant from the breast. Very few of the drugs in common use pass over into the milk and affect the infant.

THE FEEDING OF INFANTS

ARTIFICIAL FEEDING

In order to supervise the natural rearing of a baby it is not necessary to possess a knowledge of the composition of milk, but in order to guide the process of artificial feeding intelligently some acquaintance with the subject is desirable.

Milk is a perfect food, in that it contains the three essential foodstuffs—proteid, fat, and carbohydrate—along with mineral salts and water. It consists of an emulsion of microscopic fat globules suspended in a fluid containing the sugar, salts, and proteid.

Proteid—the nitrogen containing foodstuff—is essential for the growth of the cells of the body; the carbohydrate of the milk exists in the form of milk sugar, which is extremely easily digested as compared with the starches which form the bulk of the carbohydrate of the adult diet; the fat is relatively abundant, and, as has been said, is already emulsified, or reduced to such a state of subdivision as to be readily assimilable in the intestine. Fat and carbohydrate supply the body with fuel, and their combustion in the tissues yields energy and maintains the body temperature. Fat is also indispensable to the health of the body; if it is insufficiently supplied rickets is very likely to result.

The milk proteids are of two kinds—the solid casein, and the soluble whey proteid. Casein does not exist preformed in fresh milk, but is produced in it by the action of rennin, a gastric ferment. It is, in fact, the curd of milk. When milk enters the stomach the first change it undergoes is curding, the object of the curd formation being to exercise the muscle of the stomach by the transformation of the fluid milk into a solid, or

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semi-solid, mass. The amount of curd which is produced depends partly on the kind of milk (for, as we shall see, human milk contains much less casein than cow's milk) and partly on the activity of the gastric digestion. When the digestion is feeble, as in the newly born infant, the curd is soft and flocculent; when digestion is active the curd which forms is much more dense and solid. Thus the curd formed is proportionate to the power of the stomach to deal with it, a mechanism which ensures that the digestive functions shall be fully exercised. This property of adaptation to digestive activity is possessed by no food other than milk, hence the best substitute for the milk of the woman is the milk of some other animal—namely the cow. Cow's milk is much superior as an artificial food to any manufactured preparation.

COW'S MILK AND HUMAN MILK COMPARED

The average composition of the two milks is shown in the following table:

Constituent.	Human Milk.	Cow's Milk.
Proteid . . .	1'-2'	3'5
Fat . . .	3'-4'	3'5-4
Sugar . . .	6'4	4'-5'6
Salts . . .	'1	'7
Water . . .	85'-90'	85'-86'

It should be noted that the fat is the same in both, that the sugar is less in cow's milk, and (and this is probably the chief difference) that the cow's milk contains more proteid, and particularly more of the insoluble casein, than human milk. In cow's milk

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the ratio of casein to soluble proteid is about $3\frac{1}{2}$ to 1 ; in human milk there is more soluble proteid than casein.

SIGNS OF SUCCESSFUL ARTIFICIAL FEEDING

The signs of success in artificial feeding are (1) normal development and a regular gain in weight of 4 or 5 oz. per week during the first six months, and about 3 oz. per week during the rest of infancy ; (2) absence of indigestion ; (3) freedom from rickets and other nutritive disorders towards the end of the suckling period. The first of these is the most important, and no infant can be looked on as doing well unless it is gaining at least a quarter of a pound a week. It is of the utmost assistance in rearing a baby by hand to weigh him regularly each week and record the weight.

SELECTION OF FOOD

In selecting a food for the baby we take mother's milk as our standard. The following points must be attended to :

1. The food chosen should therefore be clean milk, procured from healthy cows under the best hygienic conditions. It should be handled as little as possible between the time of milking and the time it reaches the consumer. The mixed milk of a herd is much better than so-called 'one cow's milk,' because its composition is more constant.

2. Human milk is sterile, but cow's milk swarms with micro-organisms, and must therefore be sterilized before use.

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3. The composition of the milk should be modified so as to render it to some extent like human milk.

4. The food should be given at regular intervals and in definite amounts.

STERILIZATION OF MILK, AND CLEANLINESS IN FEEDING

The bacteria of milk are grouped under four heads: (1) Lactic acid bacteria; (2) Butyric acid bacteria; (3) Proteolytic bacteria; (4) Pathogenic micro-organisms. In practice the first and last are the most important. The lactic acid group cause the milk to sour, and render it very indigestible. The principal pathogenic organisms are the tubercle bacillus, and those which (probably) cause epidemic diarrhoea. It is dangerous to give a baby ordinary uncooked milk. The best way to destroy these germs is to boil the milk for from five to ten minutes.

As soon as the milk is delivered at the house, it should be poured into a clean enamelled iron jug, which is placed in a saucepan of cold water on the fire. The time when the water boils is noted, and the pan and its contents are kept at this point for five minutes in summer and ten in winter. The jug of milk is then removed from the pan, covered with one or two thicknesses of butter gauze or clean muslin, and *cooled rapidly* under the tap. Chilling is scarcely less important than boiling. It is then stored in the coolest place in the house, and should keep perfectly sweet for twenty-four hours at least.

It is, of course, very easy to contaminate the clean

THE FEEDING OF INFANTS

milk in the process of preparing and giving the feeds, and, to avoid this, the following rules should be observed :

Feeding-bottles should be of the simplest pattern in order to facilitate cleaning. They should have neither screws, nor sharp angles which are difficult to reach with a brush. Either the Soxhlet or boat-shaped type may be used. The former is simply an ordinary bottle with a sloping shoulder and rounded bottom angles. Soxhlet bottles are cheap (2*d.* to 4*d.*, according to size) ; they stand heat well. The Walker-Gordon bottle (2½*d.* to 3*d.*) is also a strong, good pattern of this type. Two bottles should be in use alternately. After a bottle has been used it should be cleaned out at once before the milk has time to dry, and should be kept full of water, to which a pinch of soda has been added, until it is again required. Before being used a second time a bottle should be thoroughly cleansed with a brush and plenty of soap and very hot water.

The teat should be dropped into boiling water before and after use. If this is done, it needs no rubbing, and will last longer. The bottle-brush should be hung in a clean place, and should not be allowed to become foul. It may not be amiss to remark that before handling milk, or giving feeds, the nurse ought to wash her hands. The practice of tasting the milk in the baby's bottle to ascertain whether the temperature is right should not be indulged in.

In place of the above method of boiling, a regular sterilizer, with which six to ten bottles, each containing a feed, can be dealt with, may be used. The great convenience of this method well repays the slight initial cost of the apparatus.

THE FEEDING OF INFANTS

Objection has been raised to the use of cooked milk on the grounds (1) that the freshness of the milk is destroyed ; (2) that infants do not thrive on it so well as on raw milk ; (3) that it may cause scurvy. It would take more space than is available to dispose of these objections here, and I can only say that it is my experience that the dangers to which a baby fed on raw milk is exposed, especially the risk of acute diarrhoea and tuberculosis, far outweigh the supposed disadvantages of boiled milk, which have been very greatly over-estimated.

MODIFICATION OF MILK

In order to approximate its constitution to that of human milk, cow's milk should be diluted with water. For purposes of calculation, woman's milk is taken as containing 1·5-2 per cent. of proteid, 4 per cent. of fat, and 6 per cent. of sugar ; cow's milk as containing 4 per cent. of proteid, 4 per cent. of fat, and 4 per cent. of sugar.

To begin with, a dilution of equal parts of milk and water should be used. This will have an (approximate) composition of—proteid 2, fat 2, sugar 2. It is needless at present to correct the percentage of fat, but the sugar should be brought up to 6 per cent. by the addition of 4 per cent. of cane or milk sugar. This is done by adding 1 part of sugar to 25 parts of the milk-and-water mixture. A level tablespoonful of sugar weighs just about half an ounce, so we add this to $12\frac{1}{2}$ oz. of the mixture and obtain a fluid consisting of proteid 2 per cent., fat 2 per cent., sugar 6 per cent., which is perfectly well suited for the great majority of newly born babies.

THE FEEDING OF INFANTS

By the end of the sixth or eighth week it is as a rule possible to increase the strength of the mixture to 2 : 1, by the end of the third month to 3 : 1, and by the end of the fourth or fifth month to pure milk. When this method of increasing the strength of the milk mixture is adopted it is not necessary to use cream at all, which is a distinct advantage, because cream is expensive, is very variable in its fat content (10 to 40 per cent.), and is even more liable than milk to bacterial contamination. Whether the cream is obtained by gravity, or by centrifugalization in a separator, the bacteria of the milk tend to rise along with the fat globules. It is true that in this method after the sixth week the infant is given considerably more proteid than he would normally receive, but this apparently is of no consequence if the infant can digest it, and if care is taken to increase the strength gradually there is usually no difficulty in educating his stomach to digest the comparatively large quantity of proteid. Excess of fat above what is contained in undiluted milk is almost as bad as too little. In the latter case rickets will probably ensue, in the former acute or chronic gastro-intestinal mischief.

SIZE OF THE FEEDS, AND INTERVALS

The size of the feeds should be proportioned to the size of the stomach, and the rule to be adhered to is one which is very easily remembered—viz. one ounce of fluid for every month of life up to the six or seventh month. Thereafter the feeds scarcely require to be increased in bulk. The intervals are the same as in breast-feeding. Over-feeding and too frequent feeding are both disastrous to health, and the intervals given

THE FEEDING OF INFANTS

are the minimum. We may tabulate the above statements thus :

Age Months	No. of Feeds.	Intervals.	Quantities at each feed.	Proportions: Milk. Water.	Oz. of Milk per 24 hours.
1	10	2 hrs.	1-2 oz.	1 : 1	5-10 oz.
2	10	2 "	2-3 "	{ 1 : 1 2 : 1	10-20 "
3	8	2½ "	3-4 "	2 : 1	16-22 "
4	6	3 "	4-5 "	3 : 1	18-24 "
5	6	3 "	5-6 "	pure milk	30-36 "
6	6	3 "	6 "	"	36 "
7	6	3 "	6 "	"	36 "
8	5	3 "	7 "	"	35-40 "

Not every infant, of course, requires precisely these quantities ; some thrive on less, others consume more without harm. In feeding an infant in this simple fashion the following hints will also prove useful :

1. When the diet is altered, only one change should be made at a time ; we do not increase both the bulk of the meals and the strength of the mixture simultaneously. Begin by substituting for one or two of the usual feeds bottles containing either a stronger mixture or a larger quantity, and if these agree well the new diet is given next day instead of the old.

2. Over-feeding is more common than under-feeding. A child of a year old seldom requires more than a quart of milk in twenty-four hours.

3. Crying and fretfulness are usually due rather to indigestion than to hunger. Crying is probably due to hunger if (a) it occurs immediately after a meal or shortly before the next meal is due—it is a whining cry, unlike the screaming produced by colic ; (b) it is not

THE FEEDING OF INFANTS

accompanied by other signs of indigestion—drawing up of the legs on the abdomen, and the passage of yellowish-green motions, with whitish flakes or mucus in them, and flatulence.

4. The most reliable indication that the child needs more food is cessation of the weekly gain in weight. Conversely, as long as he is gaining steadily, his food need not be increased.

5. When an infant does not thrive on such a diet as this, he requires medical advice, and his management no longer comes within the scope of this chapter. It is important to attend to even trivial digestive disturbances promptly—the longer they are neglected, the more difficult they are to cure. Persistent failure to gain weight is a very serious thing, and, no matter how well the child looks in other respects, his life is in danger so long as his weight remains stationary.

THE PROCESS OF FEEDING

It is immaterial whether the food be mixed in bulk, or whether each feed be prepared separately. In the former case each feed requires to be warmed before being given ; in the latter case boiling water is used as a diluent, and this raises the temperature of the mixture. Half a teaspoonful of sugar, or rather more, is added to each 2 oz. of milk and water. Milk should be measured in a graduated glass ; the capacity of a tablespoon varies from $\frac{1}{2}$ to $\frac{3}{4}$ oz. A feed should not last more than twenty minutes. Bottles should be warmed just before they are required, and any unfinished contents should be disposed of otherwise than at the next feed. Night feeds

THE FEEDING OF INFANTS

must not be kept hot over a food-warmer ; to do this is simply to incubate germs.

Instead of water, barley-water, thin gruel, or lime-water, is sometimes used. In ordinary circumstances they have little or no advantage.

A cereal should be added to the diet about the eighth month. As good a substance as any other for this purpose is oatmeal gruel, a tablespoonful or two of which may be stirred into each bottle. Oat-flour gruel may require to be made fresh twice daily in hot weather.

After the first few days of life, unless the infant is very feeble, the mouth needs no cleansing, provided that care is taken, by cleanliness in feeding, &c., to avoid contaminating it. Swabbing it out simply disturbs the natural flora of the cavity, and is apt to abrade the delicate mucous lining.

Vomiting immediately after a feed shows that the stomach has been over-filled ; the remedy is obvious. The vomiting of indigestion occurs at a later period, and is usually associated with colic, diarrhoea, and greenish stools containing flakes of 'curd.' Slight attacks of indigestion and fretfulness often yield to a dose (one teaspoonful) of castor oil ; the amount of food given should also be diminished.

Slight degrees of constipation may be cured by increasing the fat in the diet—adding cream, or giving a few drops of olive oil or a small piece of fresh butter, by using oatmeal gruel as a diluent, by adding magnesia to the bottles, or by using a soap suppository.

When an infant is attacked by acute diarrhoea, milk should *at once be completely stopped*, and a dose of castor oil given. The child should be fed on albumin water, made by shaking the white of an egg with 8

THE FEEDING OF INFANTS

oz. of water in a clean bottle, and adding a tablespoonful of sugar. This is given in the usual quantities, and at the ordinary intervals, according to the age of the child. If the infant is thirsty it should also have as much cold boiled water as it wishes. Prompt action on these lines has saved the life of many an infant.

When the mother has insufficient milk, breast-feeding should be supplemented by one or two bottles of cow's milk and water prepared as above. There is no danger that the two milks will disagree.

Nature supplies the infant with all the carbohydrate it requires in the form of sugar. A baby has little power of digesting starch until the seventh or eighth month, when he ought to have cut one or two teeth. Until this age milk is all-sufficient. Most proprietary foods and condensed milks contain a large excess of carbohydrate, sometimes as sugar, sometimes as starch ; they are also, in most cases, deficient in fat. For ordinary use they are as inferior to cow's milk as that is to human milk, and it is only in a few exceptional cases that they are really serviceable.

COMMON DISORDERS
OF INFANCY AND
THEIR PREVENTION

A. DINGWALL-FORDYCE, M.D.,
F.R.C.P.E.

*Extra Physician, Royal Hospital for
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*Take heed of this small child of earth ;
He is great : he hath in him God most high.*

A. C. SWINBURNE.

*Health is the second blessing that we
mortals are capable of—a blessing that
money cannot buy.*

WALTON.

*Such dainties to them, their health it might
hurt ;
It's like sending them ruffles when wanting
a shirt.*

GOLDSMITH.

*Let health my nerves and finer fibres brace,
And I their toys to the great children leave :
Of fancy, reason, virtue, naught can me
bereave.*

THOMSON.

*If we could lay to heart the obvious truth
that the children of now are the world of
twenty to forty years hence, and if we
further realized that while they are children
we can practically do what we like with them,
we can see to some extent where our re-
sponsibilities land us.*

ENNIS RICHMOND.

V

COMMON DISORDERS OF INFANCY AND THEIR PREVENTION

AT the time of birth the vital, organic connexion between mother and child ceases : the baby's development has now proceeded so far that it is capable of breathing, digesting, and maintaining its bodily warmth by itself—in a word, it is able to live alone.

CHARACTERISTICS OF HEALTHY INFANCY

Every day of life sees the development of new powers—the body grows apace, the special power of each organ increases quickly, there is constant multiplication of cells in the body with the formation of new tissue, and a constant increase in the functional vigour of the cells of the different organs. There is consequently very rapid change taking place in the body—all the cells are working hard ; it is natural for a baby's development to be rapid and constant, it is impossible for it to be at a standstill, and, if development is not progressing, the baby is going back.

THE NATURE OF DISEASE IN INFANCY

Disease consists in (*a*) disturbance of the composition or action of cells in the body ; or (*b*) invasion of the tissues by microbes ; or (*c*) both derangements combined.

COMMON DISORDERS OF

The body is a mass of cells grouped so as to form various tissues and various organs. The cells and groups of cells all have their particular functions to perform, and disarrangement means disease. Microbes are not naturally present in the tissues or organs, and when they do force an entrance they cause disorder and disease.

THE PREVENTION OF DISEASE IN INFANCY

The maintenance of health and the avoidance of disease is secured by (*a*) keeping the cells acting normally ; (*b*) protection from infection by microbes.

1. To keep the cells acting normally we require to attend to the following :

Food.—In the adult, food is required to replace loss from wear and tear of the tissues, to keep the cells up to their natural composition and so to render them capable of performing their duties satisfactorily. In the infant, food has also to provide for growth of all the tissues. In order that the food may be made use of by the cells of the body it has first of all to undergo digestion in the alimentary canal (stomach and intestines). In infancy the powers of digestion are much more limited than in adult life, but they gradually increase : naturally, an infant lives only on its mother's milk throughout this period. To preserve a healthy condition of the tissues it is essential to maintain a good digestion : it is only well-digested food which is of value to the body.

Atmosphere.—A pure atmosphere is equally important with well-digested food. Fresh air is a universal tonic.

Cleanliness.—Cleanliness is essential to preserve a healthy surface, more particularly in such areas as are adjacent to sources of discharge.

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Rest.—All the cells of an infant's body are working at high pressure, and frequent rest is consequently necessary. A healthy infant sleeps for the greater part of each day.

Exercise.—Free movements are natural to the healthy baby. By the exercise of muscles and limbs, development is aided, and the free circulation of blood is helped.

Temperature.—An infant is readily affected by changes in temperature, and has less power than an adult of resisting great cold. It consequently must be so clothed as to ensure the preservation of its bodily warmth. The clothing, however, must not be too thick or too heavy. Heavy clothing, particularly in the cot, prevents free exercise of the muscles, and it is also injurious for the child to be kept too warm.

Environment.—An infant is markedly susceptible and adaptable though unreasoning. Environment is bound to place its stamp upon it.

Drugs.—Drugs such as tonics can occasionally be used with success as substitutes for some of the above conditions, such as food and exercise, when these cannot be satisfactorily obtained. Such artificial methods of assisting nutrition must always be left for the consideration of a doctor.

2. To avoid infection by microbes the following points must be noted :

Disease-producing microbes are very simple forms of vegetable life. They multiply readily in number, but for life and multiplication they require warmth and moisture. These they find suitably in the human body. The cells of the tissues where the microbes gain entrance have, however, the power of actively fighting against

COMMON DISORDERS OF

them, and, as the one side or the other gains the victory, so is the result cure or death. The power of resisting microbes varies considerably according to age, and the resisting power of an infant is markedly low. Many forms of infection take place readily in infancy. There is a very large variety of microbes, but some are not dangerous, and even the dangerous ones are not always so.

Large numbers of microbes are always dangerous to infants, and consequently cleanliness is of the utmost importance. Infection by microbes may occur (*a*) through eating and drinking; (*b*) through breathing; (*c*) through the skin.

DISORDERS CONNECTED WITH FEEDING

Suitable food and good digestion are essential for the condition of health. Unsuitable food usually causes indigestion and so leads to disease, but in some cases it produces disease without causing indigestion. Indigestion necessarily means bad health.

During the process of digestion a considerable amount of energy has to be expended by the cells of the body engaged in this function. Thereafter these cells require rest in order to regain their full power. Thus, not only must food be suitable, but there must be definite intervals between the meals. As mother's milk is the natural food for an infant, it is of course of suitable composition, but it must be given only at regular intervals. Even suitable food given irregularly is harmful; much more harmful is the irregular administration of unsuitable food.

Mother's milk is pure and clean; all artificial food must also be pure and clean.

In the dietary of an infant hand-fed the three great

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desiderata are: (a) *Cleanliness* of food and utensils; (b) *Simplicity* in composition of food; (c) *Regularity* of meals.

The disorders associated with improper feeding in infancy are: (a) gastro-intestinal affections; (b) rickets and scurvy; (c) anaemia, malnutrition, and general debility.

Cow's milk, diluted with water according to the age of the infant, with a little cream and white sugar added to it, is a suitable food for most hand-fed infants. This mixture should be scalded, and never given after a shorter interval than two hours. Milk is a food and not merely a drink. Plain water is good for the infant, and may, if desired, be given freely between meals.

WANT OF CLEANLINESS

Lack of bodily cleanliness, by interfering with the natural function of the skin, deleteriously affects the general health. It also leads to disordered conditions of the skin itself, and predisposes to parasitic conditions.

Excoriations of the skin, rashes and eczema, are very often due simply to want of care in the matter of cleanliness, and have nothing whatever to do with the general condition of the infant.

Parasitic infection of the mouth, and disordered conditions of the mucous membrane of the mouth and throat, are often due to dirty teats or 'comforters.' Rubber teats, and whatever enters the infant's mouth, must be kept scrupulously clean, and the mouth, if necessary, must be cleansed by a simple lotion.

Likewise the eyes, nose, and ears, must be carefully attended to, and no discharge should be allowed to collect.

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TUBERCULOUS INFECTION

The bacillus of tuberculosis very readily affects an infant. The infecting germs may be in the milk as it comes from the cow, or they may enter the milk in the home itself, or the infant may be infected by breathing tubercle-infected air. It is very dangerous for an infant to live beside a person suffering from tuberculosis—especially lung tuberculosis. An infant should not be nursed by a mother suffering from well-marked tuberculosis.

The milk for a hand-fed infant should be scalded before use, and, while in the home, must be carefully guarded against infection.

Though readily infected it is not common for an infant to show signs of tuberculosis during the first month or two of life. Infection is, however, particularly dangerous in infancy, as, when the disease develops, it tends to become very widespread and it often progresses rapidly.

THROAT CONDITIONS

Some infants have from birth a peculiar harsh respiration, which becomes worse on excitement. This condition usually improves as the child grows older. Associated with rickets there is also a peculiar croupy form of inspiration due to spasm of muscles in the throat, and which occurs in irregular attacks, and usually in spring.

This condition can, as a rule, be readily prevented by attention to the diet and hygiene, and by a morning douche of cold water on the back and neck. Diphtheria also attacks the infant, and it is always important in illness in infancy to closely examine the throat.

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VENEREAL INFECTIONS

A peculiar constant hoarseness in the respiration of older infants is frequently due to syphilis. Syphilis is a contagious disease which may be transmitted to the infant from the father through the mother, and yet the mother may remain uninfected. In such a case it is quite safe for the mother to suckle her child, as by some means she has been rendered safe against infection. It is not safe for any other woman to nurse the child. In most cases the mother of a syphilitic baby has syphilis, or has previously had it.

A syphilitic infant very frequently is born dead. If born alive it is frequently strong and well for the first six to eight weeks of life; then the signs of syphilis appear—sores, rashes, and discharges—and such an infant is a source of great danger to its attendants. Steady treatment usually readily cures these symptoms, but the infant's vitality is frequently so low that death results. All sores and discharges from such an infant are capable of communicating the disease. Antiseptics must be constantly employed in handling the infant. One should never unnecessarily handle an infant with sores on its skin, or in its mouth, or discharge from its nose.

Infants, especially girls, not infrequently suffer from a discharge from the genital canal. The condition is usually due to want of cleanliness, and accidental infection in these cases, but the discharge as a rule contains the organism of gonorrhea, and is consequently capable of spreading this disease. The utmost care and cleanliness are consequently necessary, and it is particularly important to prevent the infant infecting its eyes by its fingers.

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CHEST CONDITIONS

It is important to avoid ordinary colds in infants. Not only are an infant's powers of breathing and sucking readily interfered with in catarrhal conditions of the nose and throat, but infection very readily extends, and bronchitis and pneumonia may supervene. In order to avoid colds it is important that the infant should be adequately clad ; but excessive clothing, leading to excessive perspiration, is not uncommonly a source of danger.

THE OCCURRENCE OF CONVULSIONS

Fits or convulsions are met with very frequently in infancy. They may be a sign of very serious disease or of only a trivial and passing condition. Prolonged irritation anywhere in the body may cause fits—thus worms in the intestine, improper feeding, untreated discharges, all may cause fits. Suitable regular feeding and cleanliness would prevent the oncoming of very many fits.

OTHER FORMS OF INFANTILE DISORDER

Young infants are particularly liable to peculiar forms of acute intestinal obstruction. This obstruction is associated with the occurrence of blood in the stools and sudden attacks of acute abdominal pain. With such conditions a doctor must be seen at once, as immediate operation is necessary.

Occasionally for a short time after birth milk is present in the breasts of the infant, and the breasts are large, swollen, and perhaps somewhat painful. This is a condition which quickly passes off, and on no account must

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the breasts be rubbed, as, by so doing, inflammation may be caused.

Much trouble and difficulty in later years may be avoided by careful training in infancy. Even in early infancy training should be commenced and steadily persevered with. During life's opening days it is abundantly true that 'prevention is better than cure,' and prevention can only be ensured by knowledge and perseverance in right-doing.

VI

SCHOOLS FOR MOTHERS

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Bairns are blessings.

SHAKESPEARE.

The Child is the father of the Man.

WORDSWORTH.

A mother's pride, a father's joy.

SIR WALTER SCOTT.

*Every parent knows not how to bring up
a child.*

ITALIAN PROVERB.

*Early and provident fear is the mother
of safety.*

EDMUND BURKE.

*The first requisite of a good citizen in
this republic of ours is that he shall be able
and willing to pull his weight.*

THEODORE ROOSEVELT.

*Concentrate on the mother. What the
mother is the children are. The stream is
no purer than the source. Let us glorify,
dignify, and purify motherhood by every
means in our power. . . . Let us have good
mothering ; that is at the bottom of happy,
healthy children.*

JOHN BURNS.

VI

SCHOOLS FOR MOTHERS

A 'SCHOOL FOR MOTHERS' is a training and educational centre where the child-bearing women of the nation may be adequately fitted for their responsible vocation of bringing up healthy children who shall ultimately take their place as useful citizens of the State. Such institutions were established in the first instance to help the poorer mothers of our large towns in the care of their young infants. They now have obviously a wider field before them, and must include within the scope of their instruction all the duties of motherhood not only to babies but to older children and all dwellers in the home. A 'School for Mothers' is an establishment to which mothers can come feeling it to be their own, and where they may obtain not only the advice and sympathy of the teachers, but the encouragement of the company of their fellows.

MOTIVES AND MEASURES

A home which consists of one or two rooms, while it must be the centre of the woman's life, yet becomes very dreary and deadening if she is shut up to it; and she seeks relief by gossiping on the doorstep or by drinking in the public-house. To provide a place

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within reach of her home where she may have pleasure and change as well as profit, and may gain a wider outlook on life, is the aim of a School for Mothers. Here her infant is specially welcome and its interests catered for both as a means of combating infant mortality and of raising the standard of the family and the home. It is wasteful to preserve an infant's life that it may grow up a neglected child in a sordid environment without a fair chance of proper development.

Fathers must also be included, so that their responsibilities may be brought home to them and the value of family life demonstrated. Many a man considers that his home duties end with bread-winning. Unfortunately, a large class are content with much less than that ; but unless the fathers know something of the needs of mothers and children, they cannot be expected to help to satisfy them, so they must be taught something of domestic and personal hygiene. Many such subjects are and will be increasingly taught in schools to the elder scholars ; but they, especially those in elementary schools, leaving at fourteen, are too young to understand the full meaning of a home and children of their own ; and it is often not till the first baby is born and clamouring for attention, that a young couple realize that there is anything special regarding a child which they should know. It is only then that they begin to realize how ignorant they are of its requirements. At such a juncture the School for Mothers finds its justification.

METHODS OF MATERNAL INSTRUCTION AT HOME AND ABROAD

Before the starting of Schools for Mothers there were many organizations and institutions doing different parts

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of the work. These may well continue to flourish and develop. Health Societies and municipal health visitors assist mothers and infants in their homes. Some Educational Committees provide courses of lectures on domestic subjects. A few societies here and there arrange for dinners or milk for mothers nursing their infants, or give milk for babies. Provident maternity clubs are attached to churches and chapels, and dispensaries hold infant consultations. But the departments had not been combined into one, as they can be in an institution devoted to this work only, and having a staff regularly on duty, to whom the mother can come for advice apart from the regular hours for classes and consultations.

The St. Pancras School, the first School for Mothers established in this country, opened its doors in June 1907, and moved to larger premises in December 1908. Soon after its opening other committees were formed to organize similar schools, and their representatives consulted the St. Pancras Committee as to methods. There are now about a dozen schools at work, some in London, others in the provinces, but all conducted on much the same lines.

In other countries similar work is being done under different names and by varying methods ; but few of the institutions combine all the departments of an English school for mothers.

In France 'Consultations de Nourrissons' and 'Gouttes de Lait' are widespread, often attached to hospitals, but frequently independent.

The Couillet Restaurants in Paris for nursing mothers are few, and not officially connected with other institutions.

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The Mutualité Maternelle has several branches in Paris and the provinces. This is a society for co-operative and philanthropic insurance for maternity among women, which combines the provident club, home visitation, and infant consultations, with a supply of milk where necessary.

In Ghent the 'Assistance Maternelle' is under the aegis of the City Co-operative Society, a very powerful organization, and has several centres in the city. It combines infant and children's consultations, provides a series of little hospitals for wasting babies where children's nurses are trained, supplies sterile milk, and gives class instruction in the ailments of children and their prevention.

In Potsdam the recently founded Kaiserin Augusta Institut comprises all sorts of departments connected with maternity and infancy. There are a pre-maternity and a maternity hospital, and also an infants' hospital, fully equipped for treatment and research, and consultations and classes are regularly held. There are also milk dépôts attached to the Institute. Professor Neumann conducts a similar institution in Berlin.

ORGANIZATION AND ADMINISTRATION OF SCHOOLS FOR MOTHERS

The methods of the different English schools vary somewhat; the following description refers to the routine followed at the St. Pancras School for Mothers. The committee consists of ladies and gentlemen interested in the subject, including the municipal health visitors and representatives of the philanthropic societies of the district. Every effort is made to avoid overlapping.

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The organizing secretaries, one of whom is the medical officer of health, are responsible for the detailed management and conduct of the business of the institution, as well as the co-ordination of the work of the staff. The staff consists of (1) two honorary medical officers, who give one afternoon a week each; (2) the lady superintendent, a whole-time paid officer; (3) an assistant, who gives time in return for training; (4) a band of voluntary helpers, who undertake different parts of the work—assisting the doctors on weighing days, teaching the knitting of baby clothes, caring for the children while classes are being held, home visiting, and the like; (5) the class teachers, who are supplied by the London County Council; and (6) a cook and a caretaker.

THE DEPARTMENTS OF THE SCHOOL FOR MOTHERS

Infant consultations are held twice a week by the medical officers, assisted by ladies, who attend regularly to assist in the weighing and supervise the distribution of tea and refreshments in the waiting-room.

The lady superintendent is always at hand to discuss and emphasize the doctors' instructions and enroll new members. The regular members attend once a fortnight at least with their babies. Others, who cannot easily leave home, or live at long distances, come less often.

Dinners are provided every day except Sunday for nursing mothers. Expectant mothers may also be supplied during the last three months of pregnancy when they are unable to secure sufficient nourishment at home. The dinners are ordered as a medical prescription, and no mother may come more than three times without an order from a doctor, who is not necessarily one of the medical officers to the institution. The babies must be

SCHOOLS FOR MOTHERS

brought to the consultations regularly, unless under the care of an outside practitioner. Some mothers pay for themselves, others are paid for by friends, and the cost of needy cases is met by the School Committee. The sum charged is $1\frac{1}{2}d.$, which does not quite cover the cost of food.

Classes are of various kinds. The London County Council provide several courses free of charge, which are given by their own lecturers. The same body counts the lady superintendent as one of their lecturers for the school only. Her syllabus has been approved and the lecturing fee paid by the Council. The Board of Education also recognize the instruction given, and make a grant according to the number of members. This course is the systematic one on infant care, and all new members are urged to join it. The County Council lecturers give courses of demonstrations and practice in artisan cookery, with instructions as to prices, and in cutting out and mending children's clothes. Lectures are also given on elementary hygiene, the care of the home and person, and simple housekeeping, home-nursing, and the care and training of older children. The latter lectures prove very popular, and are attended by those who have already attended the course on infant care.

It is probable that the Local Education Authority of any district which maintains a staff of teachers of domestic subjects would arrange for courses in a school for mothers, provided certain minimum numbers and conditions can be guaranteed, and that the Board of Education would recognize such teaching.

Club for older girls and young women.—The object of this department is to attract older girls and young wives, and awaken in them an interest in domestic life and

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hygienic matters. This is attained by holding discussions on health subjects, while dressmaking, needlework, knitting, and other forms of manual employment are being carried on. A band of voluntary helpers instruct in these subjects, and a professional teacher leads the discussion.

Provident Club.—The need for extra help in the home, and for special nourishment and clothing at the time of confinement, points to the necessity of laying by weekly sums beforehand to provide for these additional expenses. The School adds a small bonus on sums over the minimum. In a district like St. Pancras, where there are large maternity charities, the domestic expenses are those most needing to be insured for; in other districts the medical or midwives' fees must be included.

A fathers' department.—So far St. Pancras is unique in its possession of a fathers' branch. It is carried on as a club, open once a week, in which coffee is provided, and smoking is allowed. It is managed by several gentlemen. An address is given from time to time by a doctor, and is usually followed by discussion. A special syllabus on the duties of husbands and fathers to their wives, babies, older children, and home, has been drawn up by the medical officer of health. It includes directions respecting general and personal hygiene and the relations of private to public health.

Home visiting is essential to the successful working of a school for mothers. Only by knowing the conditions of the home life can the teaching be adapted to individual needs and its application rationally enforced. A woman may be attending the school regularly while her house is filthy. It is the home visitor who must tactfully exert pressure so as to secure amendment. This is most

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evident in connexion with the work of the cookery classes. It requires a great deal of persuasion to make the pupils actually attempt in their own home what seems so simple when demonstrated in class. Supervision also shows whether the directions for the care of the baby are actually understood and conscientiously carried out. So often a superficial assent to the doctor's words covers a profound disbelief or an almost insurmountable inertia, especially if the old way is easier than the new. Home visiting might be arranged for by the civic authorities when possible. Many babies can be so reached ; but the essence of the 'School' visitors' work is to keep straggling members together and to go to their aid in special times of difficulty or distress, so securing the more 'intensive culture' of a smaller number.

Qualifications of the lady superintendent.—The rôle of lady superintendent is so important in a school for mothers that her training and equipment require special consideration. She should have some knowledge of sick nursing, but a full three years' course is less important than a training in the nursing of sick children and in district work generally. A knowledge of women's ailments is also valuable, for it will be needed constantly. She must have special training in maternity work and the care of infants, but the ordinary sanitary certificate, though valuable, is not essential. Practical experience of the homes of the poor, their educational and economic limitations and possibilities, is a *sine quâ non*. Some knowledge of the problems of poverty, unemployment, and relief is also desirable, for the superintendent is certain to have to deal practically with them, and may make many a blunder if she is not forewarned and forearmed.

The fact that the feeding of necessitous mothers is

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carried on raises many questions in the minds of expert philanthropists, and requires most careful management by the person who can know most about the family life and individual requirements of each member. A capacity to organize and attract voluntary workers will much lighten work, and a clear head for domestic account-keeping will avoid much trouble. Obviously, sympathy with the scholars and love of babies will be necessary if the school is to be a success.

Financial considerations.—The cost of a school for parents must necessarily depend on its locality, size, and complexity. Rent, taxes, furnishing, firing, light, and service will all vary according to town or district, and secretarial expenses may in some centres prove heavy. The salary of a well-equipped whole-time superintendent should be not less than £120 a year. The mothers' payments for membership and food amount only to a small fraction of the total cost, and grants from Education Authorities only help to meet the expenses of lecturers and lectures.

It is now becoming evident to all interested in national health questions that the movement for the establishment of schools for mothers, or schools for parents, as they might more wisely be termed, will grow, and that fresh ways and means will be discovered to further the education of mothers and fathers and those responsible for the care of children, if the next generation is to be freed from the evils that have lately been so vividly revealed to us as resulting from ignorance, apathy, and neglect. A number of such institutions on a small scale would probably be the most effective: to do the most good they must be in close contact with the homes of those for whose help they exist and hope to improve.

SCHOOLS FOR MOTHERS

The Kindergarten.—There is another department of work which might very well be attached to Schools for Mothers. It is the Free Kindergarten for children under five. A few such kindergartens exist already, and the parents have been encouraged to come and see what is going on. This rouses their interest in the training of the little children, who are greatly benefited by a few hours each day under a kindergarten teacher in a nursery where the numbers are small and the teaching can be suited to individual children.

The Board of Education has already considered the establishment of such nursery schools, but there would be distinct advantage in having them attached to a school for mothers, as the parents are more likely to take an interest in the training given at an institution to which they themselves belong, than in a State institution which takes the children off their hands and does not expect their assistance.

VII

THE RÔLE OF THE
CRÈCHE OR DAY
NURSERY

F. S. TOOGOOD, M.D., D.P.H.

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Infirmary ; Chairman of the Executive
Committee of the National Society of Day
Nurseries*

*Men think it is an awful sight
To see a soul just set adrift
On that drear voyage from whose night
The ominous shadows never lift ;
But 'tis more awful to behold
A helpless infant newly born,
Whose little hands unconscious hold
The keys of darkness and of morn.*

JAMES RUSSELL LOWELL.

Nations are gathered out of nurseries.

CHARLES KINGSLEY.

*Our ground is good and we work it to the
utmost ; but our chief ambition is for the
nurture of our children.*

JOSEPHUS.

*The bearing and the training of a child
Is woman's wisdom.*

TENNYSON.

*Take this child away and nurse it for
me, and I will give thee thy wages.*

THE BIBLE.

*I have never written a pamphlet on
nurseries ; first, because I never write
about anything except what I know more
of than other people ; secondly, because I
think nothing much matters in a nursery—
except the mother, the nurse, and the air.*

JOHN RUSKIN.

VII

THE RÔLE OF THE CRÈCHE OR DAY NURSERY

THE systematic provision of institutions for the care of young children separated from their parents during the working hours of the day has attracted much attention both in philanthropic circles and also in Government and municipal departments. It is no new thing that a mother employed during the day should arrange for the care of her child during her absence, yet until quite recently there was no large proportion of women so situated, and therefore the demand for such accommodation did not need organized effort from any outside association.

THE WORKING MOTHER

Increasing keenness of competition in trade, and the development of labour-saving machinery, have made a great demand for poorly paid labour, and preferably for female labour. It is impossible in the scope of this article to make any attempt to deal with the common causes which have created this demand. It is, however, a fact that there is an increasing inquiry for women's labour in factories and other industrial undertakings. The superior mental alertness of women, their rapid acquisition of processes requiring tactile dexterity, their

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greater docility, and the absence of trade-union organization, have been cited as additional reasons for the preference shown by employers of labour for such workers. The scarcity of domestic servants, and the chronic condition of unemployment amongst certain classes of men, are direct results of the competition of female labour in trades which formerly employed only men.

Commencing factory life immediately upon leaving school, not many years elapse before a girl earns the wages of a proficient workwoman, and when, in obedience to her primal instincts, she either marries or enters into some less-regularized union, the complication of expectant and ultimately of realized motherhood has to be faced.

‘MINDERS’ VERSUS MOTHERS

Urged by compelling poverty to remain at her work to the last possible moment, it has been asserted by many humanitarians that this continuance of employment in the latter periods of pregnancy must exert a harmful influence upon the mother and child. In certain specially unhealthy occupations this undoubtedly is the case ; but in ordinary healthy occupations I am certain that no ill effects result from a continuance of employment during the last weeks of pregnancy. The idea is a mistaken one, based upon sentimental and aesthetic reasons. In the lying-in wards of Lewisham Infirmary, of which I am in charge, there are many factory girls and women admitted as patients ; there are also many domestic servants. The former continue at their employment as long as possible ; while the latter are compelled to apply for admission as soon as their condition is

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discovered, which is usually about the sixth or seventh month. It has been noticed that the latter class have, as a rule, difficult labours, owing to the sedentary, lazy life which they are compelled to lead in their enforced retirement. The factory hands, however, do not appear, either in themselves or in their infants, to be harmed by remaining at their work.

In order that the mother may resume her function as wage-earner, some disposition of the child must be made during working hours.

In some cases, with a reversal of the usual function, the father tends the baby whilst the mother earns the money, but, where paternal devotion is not available, the offices of a neighbour are secured by the payment of 'sixpence a day and find your own food.' This functionary is known as a 'minder'; she is subject to no supervision, and her methods are open to serious criticism.

If the mother's place of work be within easy reach of her child, she may visit and suckle it during her meal-time; but, if this be impossible, then the bottle is requisitioned during the day, although the breast-feeding may be continued during the night. In spite of the obvious inducements to discontinue breast-feeding, maternal instinct is still an impelling factor, and I have been told more than once by mothers that it is cheaper to spend the money on food for themselves and to suckle the baby than to buy cow's milk for the infant.

MORTALITY AMONG THE OFFSPRING OF WORKING MOTHERS

A large amount of loosely considered matter has been written and spoken about the death-rate of children in

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their first year of life. It is imagined by many that every woman is capable of rearing to maturity the maximum number of children which she can bring into the world. It is not an uncommon occurrence for working women to give birth to a child every year. Unless such a mother is in a financial position enabling her to procure skilled assistance some of her children almost inevitably must perish. This condition of things is still regarded with equanimity by parents, and also, until recently, by those who affect to give expression to municipal and imperial thought. It has been stated that any rate of infantile mortality exceeding 80 per 1,000 should be regarded as unduly high. Such a standard must be purely arbitrary, and it appears to me to be injudicious to attempt to fix a normal rate upon such a matter, especially when it is well known that local conditions of labour and of epidemics differ so widely in the various districts. Unless, therefore, assistance can be paid for, an ordinary housewife prepared to devote the whole of her time to her home is not likely to be able to rear all the children she is capable of bearing.

How much more difficult then is the case of those women who have, in addition, to earn a livelihood for themselves and for their families! Unless some organized effort is made by the community, the mother is compelled to avail herself of the services of the 'minder,' who is often, doubtless, a worthy woman doing her best according to her lights, but frequently she is a most reprehensible person, ignorant, dirty, and vicious. In my personal experience I have met with instances where laudanum was habitually given to children to keep them quiet, with the result that the babies were 'good' only when in the care of the 'minder.'

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The preparation and the administration of the food is usually very faulty, where cleanliness is not regarded as being essential, or even a condition to be striven for. In most districts—and especially is this the case in manufacturing centres—it is only the incapables who are minders, all those who can 'do a day's work' finding ready employment at the various factories. Inquiry has shown that the infantile mortality of many Midland towns approaches 250 per 1,000, and when we reflect that this rate includes the infants of all classes, it is evident that a rate embracing only the children of the poorer classes would show a much higher ratio of deaths. It is but recently that there has been any expression of public opinion upon the question of the preservation of child life. While our birth-rate remained high, and our population appeared to be expanding, the wastage of potential citizens was disregarded—it is doubtful if its significance was understood. If any thought was bestowed upon the matter at all, the idea of abnormality did not obtrude itself. But, with a falling birth-rate and an ever-increasing competition in trade and armaments with other nations, the maintenance of the numerical strength of the nation, although not yet a burning question, is even now of sufficient importance to give rise to feelings of uneasiness.

THE EVOLUTION OF THE CRÈCHE

The crèche is a recognized institution in most continental cities. Day nurseries have existed in France since 1844. In this country there has been no lack of voluntary help, either in pecuniary assistance or in personal service, and the knowledge that needless suffer-

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ing was inflicted upon children separated from their mothers during the working hours of the day led to the establishment, by voluntary effort, of nurseries where mothers could leave their children during the hours of toil. Although to the trained sanitarian the condition of the ordinary 'minder's' establishment is noisome and unhealthy, it by no means follows that the mothers who patronize it regard it in the same depreciatory spirit. The idea of inspecting the methods of feeding would, in all probability, not occur to them, and any evidence of curiosity upon this or any other point would certainly be discouraged by the 'minder.'

There is often an entire absence of appreciation on the part of the parent for the hygienic advantages of the crèche, which has to enter into competition with the established interests and customary rights of the 'minder.' The charges of day nurseries vary greatly; the usual tariff is 4*d.* a day, including food. In most cases there is some elasticity in the regulations, which permit gratuitous admission in exceptional cases. Although there is constantly this 'cutting' of the 'minder's' usual charge, the sturdy independence of most mothers resents any suggestion of charity, and unwise attempts at patronage often lead to an exhibition of hostility which may break off relations. Another objection raised by mothers is to the usual bath upon admission, not, it appears, to the act of ablution itself, but to the implied neglect of cleanliness on the part of the parent. The exercise of a little tact will usually get over this difficulty, and the bestowal of judicious praise encourages a spirit of emulation, leading to a competition amongst mothers as to the production of the cleanest and tidiest baby.

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It is unnecessary to discuss details of organization and administration here, even if the exigencies of space did not forbid, for these can be readily obtained elsewhere. The methods of management can only be adequately learnt by actual practice at a good crèche. As between the managers of the day nursery and the public, to which an appeal for funds is addressed, there are several questions which require answering. It has been urged that nurseries supported by public subscription may easily have a pauperizing tendency. To get something for nothing invariably deteriorates the moral fibre of the recipients. Such a charge, therefore, must be made for each child as would represent the cost to the mother if she were able to keep it at home. The argument as to the breaking up of home life and the destruction of maternal instinct has, I think, little to commend it. If a woman is compelled to leave her child in order to earn the wherewithal to sustain it, then, whether she pays for it at a 'minder's' or at a nursery is not a material point. It is, however, essential that adequate inquiry should be made into the circumstances of each applicant, otherwise a benevolent institution might be imposed upon, and an exploitation of philanthropy be rendered possible. Children should not be taken care of in order that a woman may be compelled to labour for a lazy husband, nor should mothers be encouraged to devolve the care of their children upon others simply to enable them to increase the family earnings where the father is already earning, or able to earn, a sufficiency. The community has undoubtedly an interest in the preservation of infant life, but the dividing-line between parental capability and communal responsibility cannot be decided by hard-and-fast rules, and obviously needs

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undivided inquiry and investigation. Illegitimate infants are excluded from many crèches.

The relation between the community and the employer of labour has also to be considered. It is an anti-social act for an employer to cast upon the general community any portion of the cost of his labour bill. If he employs female labour, it is no part of the duty of his fellow citizens to provide crèches for the children of his employés, who otherwise would be unable to work for him. The employment of cheap female labour involves duties in the assumption of which the employer should reasonably be called upon to undertake his fair share.

The educational rôle of the crèche cannot be overlooked. Under judicious management, each nursery should be a centre from which emanates a stream of knowledge upon all matters relating to child life. Every mother will learn something which she will pass on to others.

The utilization of crèches as training-schools for nurse-maids has been advocated by the National Society of Day Nurseries. This body is arranging to grant a certificate upon evidence of training at an approved crèche.

VOLUNTARY AND MUNICIPAL CRÈCHES

With the rapid growth of the public health service, the possibilities of the day nursery as a means of diminishing infantile mortality has naturally attracted municipal attention. Education committees and health authorities have investigated the matter and collected much information.

In July 1903, at a conference of London Sanitary Authorities, it was resolved that Parliamentary sanction be sought to enable borough councils to establish

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crèches. In many provincial centres similar exhibitions of interest have occurred, and meanwhile voluntary effort has, in the usual course of events in this country, anticipated action by the State, and in every manufacturing town non-sectarian nurseries are springing up. In some of these the zeal of the promoters is more in evidence than any knowledge of essential details ; and it is to standardize these efforts, to maintain their efficiency, and to guide the endeavours of the worker along sound lines that the National Society of Day Nurseries is labouring.

VIII

MILK DÉPÔTS
AND KINDRED
INSTITUTIONS

JOHN J. BUCHAN, M.D., D.P.H.

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Lancashire*

*An infant crying in the night,
An infant crying for the light,
And with no language but a cry.*

TENNYSON.

*Love seeketh not itself to please,
Nor for itself hath any care,
But for another gives its ease,
And builds a heaven in hell's despair.*

WILLIAM BLAKE.

*The instinct to protect and cherish life is
indestructibly innate in every one, but the
peculiarity of it ever remains a mystery to
us and others.*

GOETHE.

*Is it not monstrous that the fate of a new
generation should be left to the chances of
unreasoning custom, impulse, fancy?*

HERBERT SPENCER.

*Wherever the health of the citizens is
concerned . . . all governments that are not
chimerical make haste to interfere.*

CARLYLE.

*And to whatever vested interest which
stood up gainsaying merely 'I shall lose
profits,' the willing legislature would
answer, 'Yes, but my sons and daughters
will gain health, and life, and a soul.'*

CARLYLE.

VIII

MILK DÉPÔTS AND KINDRED INSTITUTIONS

ALL artificial feeding, however well thought out and regulated it may be, is only a poor substitute for the natural food of the infant. In every corporate attempt, therefore, to reduce the infantile death-rate, measures for the promotion of breast-feeding must first be considered. No efforts made for the provision of a suitable food for hand-fed infants must be allowed to defeat or obscure this primary consideration. Nevertheless, such a provision plays an important part in any scheme for the preservation of infant life, for there are many real difficulties attending hand-feeding, especially among the poorer classes of the community.

THE AIM OF THE INFANT MILK DÉPÔT

It is probably no exaggeration to say that the death-rate among infants artificially fed is five times that among those breast-fed. The high mortality and excessive morbidity among hand-fed infants led to the establishment of milk dépôts, in which the natural conditions existing in breast-feeding are as far as possible imitated. In breast-feeding the infant is nourished on a milk free from any outside contamination. The milk of a nurs-

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ing mother has a peculiar chemical composition, and possesses special physical and vital characters. At the milk dépôt cow's milk is so modified and sterilized, or pasteurized, as to resemble human milk, and the infants fed are kept under observation.

THE PREPARATION OF MODIFIED STERILIZED MILK

The source of the milk should be under the supervision of the authority responsible for its distribution, so as to secure a pure supply. In this country, as none of the bodies possessing a dépôt own the farm from which the milk comes, this can only be attained by inserting stringent conditions into the contract for the supply of the milk, providing for the inspection and regulation of the general sanitary circumstances of the farm, the standard of the milk, the time of delivery, and the methods of milking and transit.

On arrival at the dépôt the milk is strained and modified, so as to make its chemical composition resemble that of human milk. This modification is usually carried out by the addition of cream, sugar, and a little salt to the milk, but the exact amount depends greatly on the age, condition, and progress of the infant. Water is then added in certain proportions, and the milk bottled, the bottles being arranged in sets of seven to ten, each set constituting sufficient for a day's supply, and each bottle representing one meal for the infant.

No general rule as to the amount of each meal or of the day's supply is applicable to infants of the same age. The usual amount given in St. Helens is as follows :

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Age of Infant.	Number of Bottles.	Composition of each Modified Milk.	Feed. Water.
1st Month			
1st Fortnight	10	$\frac{1}{2}$ oz.	1 oz.
2nd „	10	1 „	$1\frac{1}{2}$ „
2nd Month	10	1 „	$1\frac{1}{2}$ „
3rd „	8	2 „	2 „
4th „	7	$2\frac{1}{2}$ „	2 „
5th „	7	3 „	2 „
6th „	7	4 „	2 „
7th „	7	$4\frac{1}{2}$ „	2 „
8th „	7	6 „	1 „
9th „	7	8 „	—

The bottles, when filled, are closed by means of spring stoppers. Each set is put in a wire basket, labelled, and then placed in the sterilizer. In St. Helens the practice is to submit the milk to sterilization at 10 lb. pressure of steam for 20 minutes. The sterilizer used is a large galvanized iron cylinder, 8 ft. high and 3 ft. in diameter. The base of the cylinder consists of a copper tank, 1 ft. deep, which is almost filled with water, while the top is fitted with a thermometer, a safety valve which blows off at 10 lb., and a cold-water spray for cooling the milk after sterilization. The cylinder rests on a fireplace, which boils the water in the copper tank; the inside is partitioned off by shelves on which the baskets of bottles are placed. After sterilization the milk is rapidly cooled by a cold-water spray, and is ready for distribution.

HOW THE MILK IS USED

Each bottle is warmed to blood heat, and only opened before feeding. A wide rubber teat is rapidly fitted over the mouth of the bottle, and the milk is thus given directly to the infant. A fresh bottle is used at each

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feed, and any milk not taken at the time must not be offered again to the infant. Thus, when the milk is once sterilized, it is given to the infant in a sterile condition.

The mother is taught how to turn out and cleanse the rubber teat. She is expected to bring her baby regularly to the dépôt, where it is weighed and its progress noted. In those cases where the infant cannot be brought it is from time to time visited and weighed at home. The mother is always informed how the milk is prepared, and given reasons for its preparation, and usually takes a keen interest in the process, and in the advance in weight of her infant.

PRACTICAL RESULTS

A milk dépôt for infants effects a saving of life by its actual results on the infants fed, and by its educational influence on the mother, and the community generally. Clinically, the infants on dépôt milk are found to gain in weight, usually at a surprising rate. As a general rule, an infant, when taken off the breast, at first loses in weight, and the earlier the age at which hand-feeding is begun, the greater is the loss, for a young infant often experiences difficulty in adapting itself to artificial feeding. Infants are found, however, to more rapidly accommodate themselves to the use of humanized and sterilized milk than to other artificial foods, and frequently they gain more in weight on dépôt feeding than on the breast. Thus in New York, during 1901, among sixty-four infants fed on sterilized milk, the average weekly gain was $3\frac{1}{2}$ oz., while among

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sixteen infants breast-fed under similar conditions the average weekly gain was $2\frac{1}{4}$ oz.¹

Statistical evidence as to the value of dépôt milk is very difficult to obtain. A milk dépôt for infants is only part of a scheme for the preservation of infant life, and the fall in the infantile mortality rate which follows its establishment cannot be ascribed to it alone. In any case the infant death-rate varies so much from year to year in the same community, that a comparison of lengthened periods is necessary to give results of any value. The infants fed on dépôt milk are selected infants in several respects. On the one hand they have survived those special conditions which cause an infant to die within the first fortnight of its existence, while on the other they very frequently come to the dépôt in a sick and emaciated condition from the bad feeding at home. No statistical comparison, therefore, can be made between them and the infants in the general community.²

As an educational influence the infant milk dépôt is of the greatest value. It is an excellent object-lesson to all mothers as to the care necessary in preparing their infants' food. An intelligent mother who has been taught the principles which underlie the preparation of the milk at the dépôt should easily apply these principles at home. The dépôt itself forms a centre for practical

¹ PARK, W. H. : *Pathogenic Micro-organisms*. London : Henry Kimpton. 1906. The apparent advantage here of sterilized milk-feeding over breast-feeding probably arose from the more emaciated state of the infants who were fed on sterilized milk.

² DAVIES, SIDNEY : 'Notes on Infant Milk Dépôt Statistics,' *Public Health*. London : Simpkin, Marshall, Hamilton, Kent & Co. December, 1908.

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education in infant-rearing, and so supplements the theoretical instruction of the health visitors.

FINANCIAL CONSIDERATIONS

The price charged for dépôt milk varies. Whether it be graduated or not, according to the position of the parents and the age of the infant, the milk must be brought within the reach of the poorest, for one of the most frequent reasons for its use is the failure of breast milk, due to the semi-starvation of the mother, who often has to go out to work in order to support the family. In St. Helens the charges are uniform for a day's supply, 2*d.* if obtained at the dépôt, and 3*d.* if delivered at the home. The prices at other dépôts are usually a little higher than this, and average about 4*d.*

In addition to the apparatus already described, the dépôt requires to be fitted with bottle-washing arrangements, &c., and the consulting and weighing room furnished. The whole initial outlay, however, need only be small, but of course varies with the amount of work to be done. On account of their experimental nature, the first dépôts established in this country were rather more costly than they need be now. The working expenses should be small. In St. Helens, only a manageress, a female assistant, and a boy are employed.

The initial cost, income, and expenditure for 1908 in some of the British milk dépôts are as follows :

Town.	Initial Cost.	Income.	Expenditure.	Annual Loss.
St. Helens	£235	£92	£276	£184
Liverpool	£640	£1,154	£3,383	£2,229
Bradford	—	£1,762	£1,985	£223
Woolwich	—	£608	£960	£352
Glasgow	£650	£1,718	£3,530	£1,812

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In each case a loss is noted, nor is it possible for it to be otherwise. An infants' milk dépôt is not a trading concern, and its work is on the same footing as all other public health and educational work done by the community, all of which, financially considered, are failures, because their income cannot be calculated as money. The financial loss averages about £2 per infant.

OTHER MILK PREPARATIONS USED AT MUNICIPAL ESTABLISHMENTS

Dried milk¹ has recently been introduced, and has been most successfully used for infant feeding in certain Yorkshire towns, notably Sheffield² and Huddersfield. In its preparation the milk is rendered sterile, and, so long as it remains dry, it is not easily contaminated. If the milk originally has been whole and pure, dried milk forms an excellent and safe food for infants, but, unless its administration is carefully supervised, much of the educational effect of the infant milk dépôt will be lost by advocating its use.

Pasteurization has been adopted by several of the infant milk dépôts in this country, in preference to sterilization, and it is practised in the Straus dépôts in New York. Here the milk is not raised to boiling point, and the change in its physical and vital characters is less pronounced. As all the bacterial life in the milk is not destroyed by this process, it must be used within twenty-four hours of its preparation.

¹ HARPER, F. M. : 'Dried Milk Feeding of Infants,' *Medical Press and Circular*. London : Baillière, Tindall & Cox, 1906.

² See Annual Report of Medical Officer of Health of Sheffield for 1908.

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By the addition of a small quantity of peroxide of hydrogen, fresh milk has been rendered sterile, and this milk, known as 'Buddeized Milk,' has been used for infant-feeding at the Infant Milk Dépôt at Leith.¹

OBJECTIONS TO STERILIZED MILK

The danger of scurvy arising from the use of sterilized milk, I believe, has been exaggerated. Very few cases have been reported, and such, apparently, only occurred in the practice of hospital physicians, and seem to have been exceptional in other respects. It is almost the unanimous opinion of medical men who have been associated with the work of infant milk dépôts, that the infants suffer no ill. 'We have numerous infant milk dépôts, both in this and other countries, supplying such milk on a very large scale, the number of infants fed annually amounting to many thousands. Surely, if such a danger as is alleged really existed, indisputable evidence of it would, ere this, have been forthcoming.'²

MILK LABORATORIES

The contamination invariably found in market milk is due to the present conditions under which it is obtained, and with care it is almost all avoidable. But pure fresh milk can only be secured at the present time by complete control of the whole machinery of milk-production and distribution. The milk must not only be pure at its source, but the subsequent development of bacteria must

¹ See Report of Dr. William Robertson, Medical Officer of Health for Leith.

² MILLARD, C. K.: Report of Medical Officer of Health of Leicester for 1907.

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be prevented. This is carried out by keeping the milk, when collected, at a very low temperature. At the Infant Milk Dépôt, Rochester, U.S.A.,¹ the milk distributed is neither sterilized nor pasteurized, but such scrupulous care is taken in the milking, handling, and distribution, that, on examination, on an average not more than 14,000 bacteria per cubic centimetre are found in it.

At the Walker Gordon Laboratories in this country, at Sudbury Park Farm, Middlesex, pure fresh milk is prepared for infants.² The cowsheds are without a sanitary fault, the cows are fed with scientific precision, and are groomed and washed regularly. The milking is conducted with the same aseptic precautions as those with which surgeons perform operations. The udders are washed before milking, the men wear sterilized coats, and the milk is taken through sterilized cotton-wool into special milking-pails, so that it is only at the moment of the passage from the cow to the pail that the milk is open to any contamination. The milk is separated and taken into a cooling-house, and then modified and placed in suitable quantities in sterilized bottles.

The Leeds milk experiment of 1906³ was conducted on much the same lines, the milk here being obtained from Mr. Sorrensen's Model Farm at York, and the experiment left little doubt 'that, for children just weaned, the provision of a pure milk supply was attended by a great saving of infant life.'

¹ MCCLEARY, G. F.: *Infantile Mortality and Infants' Milk Dépôts*. London: P. S. King & Son. 1905. 6s. net.

² VINCENT, RALPH: *The Nutrition of the Infant*. Second edition. London: Baillière, Tindall & Cox. 1904. 10s. 6d. net.

³ CAMBRON, J. S.: Report of Medical Officer of Health of Leeds for 1906.

MILK DÉPÔTS AND

INSTITUTIONS FOR THE PRESERVATION OF INFANT LIFE

The infant milk dépôts of this country follow generally the procedure laid down by Dr. Dufour in the Goutte de Lait, at Fécamp, in 1894. Before this date, however, Budin had organized his Consultation de Nourrissons at the Charité Hospital, Paris, where the feeding and rearing of breast-fed as well as hand-fed babies was supervised. Many of the methods of the Consultation de Nourrissons have been adopted in this country, even where infant milk dépôts have not been established. These are variously called Schools for Mothers, Infant Dispensaries, Babies' Clubs, &c., and in some of them the mother herself is fed so as to enable her to continue suckling her infant.

Institutions of the type of the infant milk dépôt had been in existence for some years, both in France and the United States, before their establishment in this country in 1899. The first appears to have been a Consultation attached to the Maternity Hospital at Nancy in 1890; then, in 1892, Budin's Consultation de Nourrissons was organized, and the Goutte de Lait, at the Belleville Dispensary, Paris, opened by Dr. Variot. The Hon. Nathan Straus established his Infant Milk Dépôt in New York in 1893, and Dr. Dufour the Goutte de Lait at Fécamp in 1894. Since then similar institutions have been opened at different places in all the countries of Europe and in many other parts of the world. The towns in Great Britain where infant milk dépôts have been established are :

Battersea, Bradford, Dundee, Finsbury, Glasgow, Lambeth, Leicester, Leith, Liverpool, St. Helens,

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Sheffield, Woolwich, York. The dépôt at Finsbury has been discontinued. The reports of the Medical Officers of these places should be consulted as to details.

PRACTICAL CONCLUSIONS

In any complete scheme for the preservation of infant life some provision must be made for the benefit of hand-fed infants. At the present day it is impossible to ensure a pure milk supply reaching the infant from the ordinary market, and, even if it were possible, the home contamination¹ which is bound to occur would soon render that supply dangerous. The protection afforded by an infant milk dépôt supplying sterilized modified milk in bottles to hand-fed infants is the best yet discovered. The sphere of such a dépôt is strictly limited; it must be used as part of a general plan, the success of which will greatly diminish the number of infants to be supplied with dépôt milk. At St. Helens, during the ten years the dépôt has been in use, the number of hand-fed infants has fallen from 20 to 5 per cent. of the total births. There are at present in the borough only 150 infants being hand-fed, about half of whom are nourished on dépôt milk. Infant milk dépôts, like fever hospitals, must work for their own extinction.

¹ NEWSHOLME, A. : Presidential Address, *Public Health*. London : Simpkin, Marshall, Hamilton, Kent & Co. December, 1899.

IX

LAW AND INFANT
LIFE

STANLEY B. ATKINSON,
M.A., M.B., B.Sc., J.P.

Barrister-at-law, Inner Temple; Member, Central Midwives Board; Manager of the Metropolitan Asylums Board; Late Honorary Secretary of the Medico-Legal Society; Author of 'The Law in General Medical Practice'

*Neglect of the child is not only criminal ;
it is suicidal.*

DAVID WATSON.

Work for the children is better than pilgrimage or Holy War.

MOORISH PROVERB.

*If the people die for want of knowledge,
they who are set over them shall also die for
their want of charity.*

JEREMY TAYLOR.

*I consider that children are the truest
indices of the sanitary condition of a
crowded neighbourhood.*

GEORGE A. WALKER.

*After all, infant mortality is only a statistical
expression of bad conditions by which
infant life is surrounded.*

HERBERT SAMUEL.

*I hold that the two crowning and most
accursed sins of the society of this present
day are the carelessness with which it regards
the betrayal of women, and the brutality
with which it suffers the neglect of children.*

JOHN RUSKIN.

IX

LAW AND INFANT LIFE

SAVAGE races show little regard for infant life. Even cultured people like the Greeks and Romans have manifested but scant respect for the infant. The value of the young child is a modern discovery. Civilized states are only beginning to realize the necessity of protecting their infants. This is particularly true of our own land.

A baby can no longer be regarded as a merely potential citizen. The youngest child is a citizen with personal legal rights, even as against its parents' 'rights,' but correlated with its parents' duties. For long the rights of the father and mother were exclusively urged in considering questions affecting little children. Infants are under the King's Peace, and, if slain by violent assault, or injured by continued passive neglect, it should be seen that the toll for the exit or maiming of a subject's life is not suffered to remain unpaid. The penalty must be imposed in order to serve as a deterrent to all similar would-be evildoers.

BIRTH NOTIFICATION

The recent growth of public opinion respecting the protection of infancy is clearly shown by the passing of the Notification of Births Act, 1907. At present

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the adoption of this Act by local authorities is optional ; where adopted it is compulsory, under a penalty of £1, to inform the Medical Officer of Health of the advent of a new citizen within thirty-six hours of birth ; no exception is made in the case of still-born nor premature (seven months) children. The parents and friends are primarily responsible for the notification, failing them the medical adviser, or the midwife concerned. In France births must be registered within three days. In English law, apart from this Act, still-born children are ignored, except that they cannot be buried in a public burial-ground, unless a statutory form has been filled up and signed by some one present at the birth, or by a medical practitioner.

LIFE, BIRTH, AND LIVE-BIRTH

In charges of infanticide at birth it is necessary to prove that the child was born alive before conviction for the alleged offence is possible. The criminal offence of 'concealment of birth' really consists in the secret disposal of the dead body of the infant. The following is a succinct statement of the law :

1. In the criminal law *a child* is a human foetus which is born, alive or dead, at such a stage of human development as experience shows is necessary for capacity to survive birth, viz. at least five calendar months from conception. For proprietary rights the embryo, at every stage of gestation, is by construction considered as a potential child.

2. A child is *born* at the moment that its body has completely quitted the mother.

3. A child is *live-born*, in the legal sense, when, after entire birth, it exhibits a clear sign of independent

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vitality : in practice, this is evidenced by at least the evanescently persistent action of the heart.

4. Positive proof of the alleged live-birth of a given now-lifeless child is necessary in law. Where respiration was never fully established, in the large majority of cases it is essential for one present at the parturition to give direct evidence, as well of the complete birth as the subsequent exhibition of a sign of life. Several legislative attempts recently have been made to extenuate and to simplify the law relating to homicide at birth. It is to be remembered that, if a child dies 'aged one minute,' its birth and death must be registered, it must be named, and formally buried. A certified midwife is compelled, by the rules of the Central Midwives Board, to have medical aid called in and reported whenever the health of a child is abnormal while she is in attendance. In English law a child born out of wedlock cannot be made legitimate by the intermarriage of its parents ; this is a relic of feudalism. The birth of a child must be registered within six weeks of birth ; it must be vaccinated within six months, unless the parent makes a declaration as a 'conscientious objector,' or there is a medical certificate for postponement.

THE DEFINITION OF 'INFANT'

The word 'infant' has several varied meanings. Clinically, a child which has not yet cut its milk-teeth is a baby ; for the purpose of estimating infant mortality, only children under one year of age are considered. Legally, infants are kept in the Poor Law nursery until they are three years old, when they are transferred to join the older children ; children reach school age at five, and leave the infant classes at seven, at which age

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the criminal law will first consider whether they are to be held responsible for their naughty conduct.

THE LEGAL STATUS OF AN INFANT

The legal position of an infant is based generally on the Common Law, and especially and definitely upon recent statutory enactments. The Common Law was stated well in *R. v. Mary Nicholls* (1874), where a grandmother had not supplied proper nourishment to her infant charge, no allegation of 'drink' being made: 'A grown-up person who chooses to undertake the charge of a human creature, helpless either from infancy, simplicity, lunacy, or other infirmity, is bound to execute that charge without wicked negligence, and, if such person by wicked negligence lets the human creature die, that person is guilty of manslaughter. Mere negligence is not enough. There must be negligence so great as to satisfy a jury that the offender had a wicked mind in the sense of being reckless or careless whether death occurred or not.' Any course of conduct likely to cause injury to an infant, whether such injury be physical or mental, is, it appears, technically ill-treatment: thus, where a woman with an infant in her arms was assaulted by a man, and the child was so terrified that it died within six weeks of the assault from, as was alleged, the shock of fear, the assailant was found guilty of manslaughter (*R. v. Towers*). At the Leicester Assizes (November 1899) a man was convicted of manslaughter, who, having assaulted his eight-months pregnant wife, so bruised the unborn child that, as a consequence, it died soon after birth. It was directed in *R. v. Ann West* (1848): 'If the child by a felonious act of the prisoner was brought into the world in a state in which it was more likely to

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die than it would have been if born in due time, and did die in consequence, the offence is murder, and the mere existence of a possibility that something might have been done to prevent the death would not render it less murder.'

INFANCY AND EUGENICS

There are legal aspects to the new science of Eugenics, and the day may come when the child will have a claim against its parents or its first medical adviser, from the fact that they did not take care to allow it to commence its career with a sound body and a sane mind. Such a claim has already been made in France. Figures are given to show that 50 per cent. of the children of inebriates are dead-born or die within the first year, and that of the survivors 12 per cent. are 'possessed' of epilepsy. Such facts indicate the need of pre-natal care and correction. After birth it may be necessary to inform an inspector of the National Society for the Prevention of Cruelty to Children, or to hint at the powers of the coroner's inquest jury, should neglectful parents fail to amend their ways. The provision of milk dépôts for infant feeding is now allowed, although, after all, the mother's breast is the best sterilizer of the infant's food. On April 24, 1905, a baby was ordered to be returned to the natural food at the mother's breast (Divorce Court, *McLaglen v. McLaglen*).

THE CHILDREN ACT, 1908

Many statutes have singled out special items from the general common law with reference to children, but

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now the Children Act, 1908, has codified the contents of more than a score of such enactments :

Part I of the Act deals with *Infant Life Protection*. Every child under the age of seven taken care of for reward for more than forty-eight hours, otherwise than by its relatives or a recognized institution, must be notified by its foster-parent within forty-eight hours to the local authority (in the Metropolis, the London County Council, or Common Council, elsewhere the Guardians), stating all the facts required ; deaths and changes of address must also be notified (sect. 1). The local authority must appoint suitable infant protection visitors (sect. 2). The foster-parents and their domiciles must be up to a reasonable standard of excellence (sect. 3). The number of children allowed can be fixed (sect. 4), and they can be removed immediately if such a change is desirable (sect. 5). The coroner must be notified of the fact of the death of a foster-child within twenty-four hours, and if no satisfactory medical certificate is forthcoming an inquest must be held (sect. 6). Policies of life insurance of infants kept for reward are made void (sect. 7).

Part II. of the Act deals with the *Prevention and Punishment of Cruelty to Young Children*. Any person of more than sixteen years in age who has the charge of any person under that age is fixed with the responsibility of properly providing food, clothing, lodging, and medical aid ; failing other means, parochial relief must be sought for the child (sect. 12) ; a heavier penalty is inflicted if the child is insured and neglected (sub-sect. 5). If a person over sixteen years of age, when under the influence of drink, takes to bed a child of under three years, which is thereupon suffocated or overlain, imprisonment or fine

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may result, unless a post-mortem examination reveals the presence of something abnormal in the child's physical condition at the time it died (sect. 13). A fine of £10 may be inflicted on any person over sixteen years of age who, having the charge of a child of less than seven years, leaves it in a room containing an open fire-grate which is insufficiently protected to guard against the risk of the child being burned or scalded so that either death or serious injury results (sect. 15).

Part VI of the Act contains *General Clauses*. No child other than an infant in arms may be present in court during the hearing of a charge (sect. 115); this may be compared with Prison Rules (April 21, 1899, sect. 14), which allow a female prisoner to take her nursling with her until it attains three months, and then, if it is not wise to separate it from its mother, the prison surgeon may order its further retention until the child's first birthday, but no longer. It is an offence, with a £3 penalty, to give intoxicating liquor to a child under five years of age otherwise than under medical direction or other urgent cause (sect. 119). It has been suggested that non-abstaining mothers *ipso facto* offend in this sense. No child under fourteen years of age must enter the bar, where intoxicating liquor is consumed, during 'open hours' of licensed premises: exception is made in the cases of railway refreshment rooms, children of the licensee, and children who are obliged to pass through the bar to other premises (sect. 120).

The Licensing Act, 1902 (sect. 2), makes a person who, being drunk in a highway or other public place, and having custody of a child, liable to a £2 fine or to imprisonment.

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INFANTS OF THE STATE

Under the Poor Law Act, 1899, the Guardians of the Poor have power to adopt, until the age of eighteen years, orphans and other children who are in the charge of those who are morally unfit to have control over them ; if the parents improve in habits the adoption may be annulled by a Court of Summary Jurisdiction or rescinded by the Guardians. The fact of the bread-winner being a drunken person implies both neglect and means whereby the vicious inclination may be gratified—such means may be provided by so-called ‘ friends.’ Neglect of wife or husband or children should be regarded as, of itself, a criminal offence. Any financial charges incurred by the Poor Law or by the Police in dealing with, or in caring for, inebriate persons and their dependents, should be treated by the Guardians or other authorities as a debt made by the offender which he must repay to the uttermost farthing. This rule already obtains in the case of inmates of reformatories ; the Children Act (following the Children’s Charter of 1904) goes so far as to provide that if a neglectful parent is in receipt of an income, it may be attached for the purpose of providing maintenance for the children. In such a way money is diverted from profitless and harmful channels of expense, and the ratepayer will be properly protected from the illicit claims of those who cost the nation far more than the man in the street has yet realized.

It is well to remember also that in not a few cases the law indirectly protects infancy by protecting the pregnant mother, as, for instance, by the provisions of the Factory Acts. The law has also dealt with the question of the

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insurance of infant lives (Friendly Societies Act, 1896, sects. 62-67).

The Central Midwives Board compels certified midwives to watch their patients, mother and child, for at least ten days, forthwith reporting any abnormality which arises. Later, in many districts, the infants are watched by municipal health visitors, who may also be women sanitary inspectors. Ophthalmia in new-born children has been made a compulsorily notifiable infectious disease in North Staffordshire.

Although it is usual to affirm that people cannot be made good by Acts of Parliament, yet such legislation both indicates the contemporary opinions, and serves, in its execution, as a means of wide education. So much has lately been done on behalf of young children that it is necessary to remind social workers that they should gain accurate information as to the present possibilities, and that they should apply the powers so conferred whenever they see the little ones being offended. With a diminishing birth-rate in mind, Sir Joseph Compton Rickett said: 'Babies are getting scarcer, and, according to the inevitable law of supply and demand, are rising in value.' Probably the main factor in aiding the declension of the infant mortality rate, in the near future, will be that the denizen of the mean street sees that somebody cares for her little British baby and its health. The imagination of the better-informed classes has already been touched; and public opinion must be fostered among those whose homes are within the magpie patches of our densely populated towns.

THE INFANT AND THE NATION

**SIR JOHN W. BYERS,
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pital, Belfast; Consulting Physician
to the Belfast Hospital for Sick
Children; President of the Belfast
Natural History and Philosophical
Society*

Nations, like men, have their infancy.

BOLINGBROKE.

*Accuse not Nature, she hath done her part ;
Do thou but thine.*

MILTON.

*Not in entire forgetfulness,
And not in utter darkness,
But trailing clouds of glory, do we come
From God, who is our home :
Heaven lies about us in our infancy.*

WORDSWORTH.

*Pride is one of the seven deadly sins ; but
it cannot be the pride of a mother in her
children, for that is a compound of the two
cardinal virtues—faith and hope.*

CHARLES DICKENS.

*Come to me, O ye Children !
And whisper in my ear
What the birds and the winds are singing
In your sunny atmosphere.*

*For what are all our contrivings,
And the wisdom of our books,
When compared with your caresses,
And the gladness of your looks ?*

*Ye are better than all the ballads
That ever were sung or said ;
For ye are living poems,
And all the rest are dead.*

LONGFELLOW.

X

THE INFANT AND THE NATION

THE late Professor Pierre Budin of Paris told his countrymen in 1892: 'Your country has need of all her children, and humanity demands that we should spare no effort on their behalf.' For this land as well as for France the question of Infant Life is a vital one.

INFANTILE MORTALITY STATISTICS

Although during the last forty years the general death-rate has fallen by at least one-sixth, the infant mortality remains almost stationary, or shows only a slight fall, and that mainly since the beginning of the present century.

In 1908, in England and Wales, 113,646 infants under one year of age died, a ratio of 121 per 1,000, which was 3 per 1,000 above the rate in 1907. Compared with the average in the ten years 1898-1907, this is a decrease of 21 per 1,000. During 1908, in the 76 great towns of England and Wales (each with a population of more than 50,000 at the Census of 1901), 57,175 infants died under one year of age. This gives a rate of 129 per 1,000, the mean proportion in the preceding five years having been 143. In the 142 smaller towns (20,000 to 50,000 inhabitants at the

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Census of 1901) 16,141 infants under one year of age died in 1908, a rate of 124 per 1,000, as compared with 154, 132, 138, and 122, in the four preceding years.

In London, in 1908, there were 14,287 deaths of infants under one year of age, a rate of 113 per 1,000 births, as compared with 116 in 1907, and with 143, the average proportion in the ten years 1898-1907; and this rate in 1908 is the lowest on record.

In the course of forty years ended in 1900, the death-rate of all ages had fallen in London by over 20 per cent., but no such corresponding reduction could be recorded in the proportion of deaths of children under one year of age, the ratio to total births having been fairly constant in each decennium. However, since the beginning of the present century, the rate of infantile mortality in London has, with fluctuations, shown an appreciable decline.

In Scotland, in 1907 (last available returns), 14,140 infants died under one year of age, giving a death-rate of 109·7. This number is 1,034 fewer than in the previous year, when the rate was 115·0. In the years 1891-1900, the average rate was 127·9. In the principal towns of Scotland (population at last Census more than 30,000) the rate for 1907 was 125·2 (Dundee 149·8, Glasgow 130·0, Edinburgh 126·0); in the large towns (population between 10,000 and 30,000) it was 108·9; in the small towns (population between 2,000 and 10,000, it was 102·6); in the mainland rural districts (districts in mainland of Scotland and not in preceding urban districts) the rate was 82·2, and in the insular rural districts (insular parts of Scotland not included in the above urban districts) it was 63·6. In all these

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groups of districts the infantile mortality rate was, in 1907, less than the average ratio for 1891-1900.

In 1908, in Ireland, 9,895 infants died under one year, the rate being 97 per 1,000 births, which is higher than in 1907, when it was 92. The infantile mortality in the 'Civic Unions' (population in 1901 of 10,000 or upwards) was 129·5 per 1,000; while that in the remainder of the country was 75·1. In Dublin the infantile mortality was 146, in Belfast 147, a ratio in each higher than in London (113), Liverpool (141), Edinburgh (126), and Glasgow (130). Thus it will be seen that, while in Ireland as a whole, the infantile mortality is lower than in either England or Scotland, the comparison in her urban centres is by no means so favourable to Ireland.

THE CAUSES OF INFANT WASTAGE

The infant death-rate is least among breast-fed children, higher among those who are hand-fed, and highest among the illegitimate. It is twice as dangerous to feed an infant on condensed milk as on fresh cow's milk, fifty times as dangerous to feed an infant on cow's milk as on breast milk, and a hundred times more dangerous to feed on condensed as on breast milk. If we could come back to the present condition of that most vigorous race, the Japanese, among whom it is said over 90 per cent. of the mothers nourish their children, our infantile mortality tables would be very different. It is a very remarkable fact that, although infantile mortality is extremely prevalent in poor and overcrowded districts, yet, even in such an unfavourable environment, the rate drops among those who feed

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their infants in Nature's way. Thus it has been found in the 'Italian Quarter' in Finsbury, that the infantile mortality among the alien Italians is much less than that of infants of English mothers living in the same district, the reason being that among the former breast-feeding is the rule.

In English cities it has often been found that autumnal diarrhoea, which is one of the great causes of infantile mortality, is much less in the Irish quarters, owing to the fact that Irish mothers generally nurse their own infants.

But even among bottle-fed infants we have found, in Belfast, that in the most unhealthy districts the amount of infantile mortality is far less among mothers who are intelligent, and who realize their parental responsibility, and who are stimulated in their efforts by regular visits to, and instruction at, our 'Babies' Clubs.'

URBAN AND RURAL INFLUENCES

Infantile mortality is greater in urban than in rural districts. This is so both in England and Scotland. Even in Ireland, where the rate is lower than in England or in Scotland, this fact is emphasized, for in the 'Civic Unions' it amounted to 129·5, while in the remainder of Ireland it was only 75·1 per 1,000, in 1908. In the Dublin registration area, in 1908, the deaths of infants under one year of age to every 1,000 births was 146, in Belfast 147, while in Glasgow it was 130, in Liverpool 141, in Edinburgh 126, and in London 113.

THE AGE FACTOR

The highest death-rate among infants occurs during the first few weeks or months of life. Thus, of those

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who die in their first year, half die within the first three months after birth, and of this large proportion half die within the first six weeks after birth. The number of infants who die in the first week after birth is much larger than the number who die in the second week of their existence, so also the number who die during the second week is much larger than the number who die in the third week, and so on progressively in an inverse proportion.

Apart from the loss of infants due to immaturity, or as the result of disease, there can be no doubt that the deaths of a certain number of children are due to the fact that, though born apparently healthy, they are the offspring of mothers who have had to work hard during pregnancy, and who have felt the pinch of poverty, and are, in a word, physically weak mothers as the result of improper pre-natal conditions. I have often seen cases of this type at the Children's Hospital in Belfast.

THE RÔLE OF OCCUPATION, ENVIRONMENT, AND OTHER CONDITIONS

Infantile mortality has a relationship to the occupation of women, especially in the case of those engaged in industries where they are apt to remain up to the time of their confinement, and to which they often return too soon. Further, such occupations often lead to the neglect of the infant at home. But it is not the factory but the home which, even in industrial towns, is the great cause of infantile mortality. Why is it that in Dublin, with hardly any industries or large mills, the infant mortality is as high as in the great industrial and commercial city of Belfast?

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As a rule, in towns in England where there is a high infant death-rate, the inhabitants are engaged in mining, textile, pottery, or other industries, and the high infantile mortality rate in these urban areas would seem to point to conditions which are inimical to infant life.

Again, excessive waste of infant life is often associated with a high birth-rate, overcrowding, and the industrial employment of married women, a state of affairs existing in many towns in England. But, on the other hand, it must be recollected that there are centres, such as Bolton, Blackburn, Oldham, Rochdale, Middleton, Heywood, Dewsbury, Glossop, and Hyde, where comparatively few children are born, but where there is a loss during infancy of an immoderate proportion of this smaller number. Broadly speaking, in the towns where there is a high infantile mortality, a high birth-rate obtains, such as Moscow with a rate of 321 per 1,000, St. Petersburg with 282, Montreal with 259, Breslau 194, Munich 192, Dublin with 146, and Belfast with 147. (N.B.—All these rates are for 1908.) In the majority, again, of towns with a low infantile mortality, the birth-rates are also well below the rate in the whole country. However, there are towns (Finchley, Ilford, Ealing, Gillingham, Erith, Enfield, Wood Green, and Southend-on-Sea) in which, coupled with a low infantile mortality, the birth-rates are above the average. Belfast has a high birth-rate and a high infantile mortality, and a large population working in textile industries; while Dublin has a high birth-rate and a high infantile mortality rate and, practically speaking, no industries.

It may be interesting to record that, in 1908, the rate of deaths of children under one year was 103 in Paris, 168 in Berlin, 183 in Vienna, 111 in Rotterdam,

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150 in Copenhagen, 156 in Hamburg, and 282 in St. Petersburg.

While poverty and unhealthy environment are contributory causes of infantile mortality, unquestionably the great cause, which constantly presents itself to those engaged in the practical work of trying to prevent infantile mortality, is maternal ignorance.

In the Minority Report of the Poor Law Commission it is stated that the mortality of infants in the Poor Law institutions is between two and three times as great as it is in the population as a whole, 'exposed to all dangers of inadequate medical attendance and nursing, lack of sufficient food, warmth and care, and parental ignorance and neglect.'

INFANTILE MORTALITY AND RACE DEGENERATION

A high infantile mortality rate denotes a far higher infantile deterioration rate. In other words, the conditions of life which bring about infantile mortality in a family, or in a given area, usually produce physical and mental weakness in other members of the families, namely, in those who manage to escape early death. As Dr. A. G. Chalmers of Glasgow puts it: 'The dead baby is next-of-kin to the diseased baby, who in time becomes the anaemic, ill-fed, and educationally backward child, from whom is derived later in life the unskilled "casual" who is at the bottom of so many of our problems.' Of this physical and mental deterioration I have had ample evidence in an industrial school in Belfast.

In 1901, in the boroughs and urban districts of England and Wales there were 77 per cent. of the

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aggregate population, as compared with 50 per cent. in 1851, a state of affairs which has brought with it many clamant problems, of which the care of the infant is not the least.

THE FALLING BIRTH-RATE

The following figures in regard to the birth-rate are the latest available, and are of interest. In 1908, in England and Wales (population estimated as 35,348,780 in middle of 1908), the birth-rate per 1,000 was 26·5, which is slightly above (0·2 per 1,000) the rate in 1907. Compared with the average in the ten years 1898-1907, the birth-rate in 1908 showed a decrease of 1·6 per 1,000. In London (estimated population in the middle of 1908 being 4,795,757) the birth-rate was 25·2 per 1,000 of the total population of both sexes and of all ages, which is the lowest recorded in the metropolis since civic registration was established. In 1867 the birth-rate—then 36·5 per 1,000—was at its highest. Since that date, with trifling exceptions, the ratio has steadily fallen until, in 1908, it was only 25·2—i.e. 0·4 per 1,000 below the rate recorded in 1907, and 2·9 per 1,000 below the average rate in the ten years 1898-1907. Calculated on the total population, the fall in the birth-rate of London during the past thirty-eight years amounted to 28 per cent. Based on the proportion of births to the number of possible mothers, i.e. the total number of women living at child-bearing ages, the fall in the birth-rate amounted to 31 per cent. during the same period. The birth-rate and the death-rate are to a certain extent interdependent, and both—together with the effects of migration—exert an influence on the sex and age constitution of the population. For example (as pointed

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out by the English Registrar-General), out of every 1,000,000 living, there were 33,000 fewer children under the age of fifteen years in 1901 than in 1871; in other words, had the proportions of populations at the several age groups in 1901 been the same as the population in 1871, there would have been enumerated at the Census of 1901 about 1,500,000 children at ages under fifteen years, instead of the 1,357,874 actually recorded. The effects of the fall in the birth-rate in London in regard to the numbers of the population have been to some extent modified by the decline in the death-rate. The death-rate, however, cannot continue to decline indefinitely, and it is a most noteworthy fact (as stated in the *Annual Summary of Marriages, Births, and Deaths for 1908*) that the effective addition to the population, i.e. the annual rate of increase by excess of births over deaths, which had been 13·38 per 1,000 living in the period 1876-1880, fell to 11·39 per 1,000 in the year 1908.

In Scotland (population at middle of 1907 estimated as 4,776,063), in 1907 (last available figures), the births registered were fewer than those registered in any year since 1895. The birth-rate, 26·98, is 0·95 less than that of the previous year, 1·63 less than the mean of the birth-rates of the previous five years, and 2·22 less than the mean of the birth-rates of the previous ten years. It is the first annual birth-rate of Scotland below 27, the second below 28 per 1,000. The births in 1907 were 3,165 fewer than those registered in 1906, and 3,522 less than the average of births registered annually during the previous five years, 1902-6. This rapid decline of the birth rate in Scotland must be considered very ominous.

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In Ireland (estimated population to the middle of the year 1908 being 4,371,455), in 1908, the birth-rate was 23·3 per 1,000, which is 0·1 above the average rate per 1,000 in the ten years 1898-1907; but in Belfast, the most populous city in Ireland (380,344), the birth-rate, 29·7 per 1,000 in 1908, is the lowest ever recorded in the city, the average rate for the ten years ended 1908 being 31·1.

For the sake of comparison the following figures are of interest:

TABLE SHOWING BIRTH-RATES PER 1,000 OF ESTIMATED
POPULATION

Scotland	26·98
England and Wales	26·05
London	25·02
Ireland	23·03
Roumania	41·07
Hungary	36·00
Prussia	33·00
Spain	32·09
Italy	31·04
Holland	30·00
Denmark	28·03
Switzerland	26·08
Norway	26·03
Sweden	25·05
France	19·07

THE NECESSITY FOR INFANT LIFE PROTECTION

The care of maternity and of infants and young children is a great national question. At the present moment there are two local authorities expending much public money upon this service. The Poor Law or

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destitution authorities are giving maintenance, and are providing special medical treatment, for poor expectant mothers, while at the same time various local public health authorities, aided by voluntary philanthropic agencies, are affording medical advice, and, even in some cases, nourishment to necessitous mothers. The whole problem of the care of birth and infancy has assumed an entirely new position and importance owing to the Report recently issued by the Poor Law Commission of 1905-9. Whatever line legislation may eventually take, it is clear that there should be sound scientific guiding principles in dealing with mothers and infants, and these should be based largely on the experience of those social workers who have had practical knowledge of this pressing problem.

THE PROTECTION OF MOTHERHOOD AND INFANCY

Legislative power should secure control from one central authority. An attempt should be made to anticipate the need for help rather than to wait for the presence of destitution as an indication for aid. Efforts must be redoubled to overcome the prevailing ignorance among the people regarding the responsibilities of motherhood. Children must be trained in our public schools as to what is essential for the proper understanding of life.

In connexion with the Women's National Health Association of Ireland, which, thanks to the ceaseless exertions of its founder, Her Excellency the Countess of Aberdeen, has done so much to educate the people of Ireland as to the laws of health, there has been established a 'Girls' Guild of Good Health.' The girls

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banded together in these guilds pledge themselves to be as healthy as possible in body and mind. A branch has been established in one of the industrial schools for girls in Belfast with seventy members, and a lady doctor associated with one of the 'Babies' Clubs' gives the girls lectures dealing with such physiological subjects as they should know, and makes matters practical by showing them how to bath, dress, and nurse a baby. The lady, who is chairman of the Infantile Mortality Committee of the Belfast Branch of the Women's National Health Association, gives these girls a practical illustration of how to cut out and to make up babies' clothes.

In order that the pre-natal conditions of the infant shall be safeguarded—and four-fifths of the value of a child's start in life, and its chance of living, depend upon the proper nutrition of its mother during her pregnancy—efforts must be made to reach the poor expectant mothers, and to guide them in reference to such matters as selection and preparation of food, occupation, housing, and temperance. They may in some cases need nourishment of a proper nature, especially during the latter half of their pregnancy, or outfits ('maternity bags') in case they do not enter maternity hospitals. In other words, the circumstances of the household of a poor expectant mother should be under continuous observation, and not only when there is temporary destitution. In this matter at least 'Prevention is better than cure.'

THE SAFEGUARDING OF MOTHER AND INFANT

Every mother should be seen immediately after her confinements, so that she may be properly guided as

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to what is best in the way of bringing up her children. The value of the Notification of Births Act is here evident, as it enables the health authorities to act at once ; and we must recollect that the danger of infantile mortality increases, the younger the child.

The principle of the ' Babies' Clubs ' or ' Schools for Mothers ' should be extended everywhere, as it is the practical teaching given in these institutions, as well as the personal interest taken in the mothers and their children—who will soon be the adults of the near future, and it may be the coming masters of the destinies of the empire—which has proved such a valuable educational influence.

XI

MUNICIPAL ACTION IN THE PREVENTION OF INFANTILE MORTALITY

JOHN F. J. SYKES, M.D., D.Sc.

*Medical Officer of Health of St. Pancras;
formerly Lecturer on Public Health, Guy's
Hospital; President of the Incorporated Society
of Medical Officers of Health; Author of
'Public Health and Housing,' &c.*

*A mother is a mother still
The holiest thing alive.*
S. T. COLERIDGE.

*As for the tender mother
Who dandled him to rest,
And for the wife who nurses
His baby at her breast.*
MACAULAY.

What is learnt in the cradle always lasts.
POPULAR PROVERB.

*'Mid pleasures and palaces though we may
 roam,
Be it ever so humble, there's no place like
 home.*
JOHN HOWARD PAYNE.

*Here woman reigns the mother, daughter,
 wife,
Strews with fresh flowers the narrow way
 of life.*
JAMES MONTGOMERY.

*Behold, the child, by Nature's kindly law,
Pleased with a rattle, tickled with a straw :
Fed at his mother's breast—nor aught so
 good,
Till tired he sleeps and thrives—on best of
 food.*
POPE.

*Civilized man becomes so clever in
mastering nature and evading the conditions
imposed on him that he ends by escaping
them altogether and disappearing from the
scene.*

'THE TIMES.'

XI

MUNICIPAL ACTION IN THE PREVENTION OF INFANTILE MORTALITY

To ascertain the causes of any evil is in great measure to indicate the remedies. It is desirable to recognize the causes of infantile morbidity and mortality in their proper proportions. The proper preventive and remedial measures will then naturally present themselves.

THE CAUSATION OF INFANTILE MORTALITY

When the number of deaths of infants under one year of age and occurring from all causes are compared, it is seen that during the latter half of the last century the improvement of environment by sanitation, although it brought down the general death-rate over one year, apparently failed to reduce the infant mortality to any appreciable extent ; this has remained practically stationary. If the ages at which infant deaths occurred be closely examined, it is found that the mortality during the second six months of life fell to a large extent, that of the second three months of life to a lesser but considerable extent, whilst that of the first three months of life rose in a marked degree—in other words, that,

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while the amelioration of *environmental conditions* was reducing the mortality in the latter months, the deterioration of other conditions were increasing it in the earlier.

If the causes of deaths of infants be closely analysed, they resolve themselves into ante-natal and post-natal causes. If the ante-natal causes be held to include pre-maturity, malformation, congenital debility, and congenital disease, these are highest at birth and during the first days and weeks of life thereafter, falling rapidly from week to week until they reach smaller and smaller proportions in the second and third months, and sink to insignificance by the end of the sixth month.

If we embrace in the post-natal causes those resulting in the disorders of the respiratory organs and the disorders of the alimentary system, including all forms of malnutrition, we find that such are lowest at birth, and commence to increase two or three weeks after birth, and continue to increase steadily through the first six months of life, and then to gradually decrease.

If the deaths from disorders of the alimentary system are closely analysed, it will be found that they form a very large and increasing proportion of the causes of deaths of infants from the first to the end of the sixth month of age, falling slowly thereafter, and that the rise in the general mortality of the population during the summer months is almost entirely due to the mortality from abdominal diseases amongst infants under one year of age.

If also the deaths from diseases of the respiratory system are closely scrutinized, it will be seen that they increase slowly through the first six months, and thence steadily decrease through the first and second years of

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life, and that the rise in the general mortality of the whole population through the winter months is not largely increased by deaths under one year in proportion to all other ages.

In other words, the conditions that have been found to be increasing the infantile mortality in the earlier days, weeks, and months of life are *personal conditions*: firstly, immaturity due to ante-natal conditions, especially of the mother; and, secondly, post-natal conditions, especially the defective alimentation of the infant by the mother, and, in a lesser degree, the deficiency of clothing and warmth provided by the parents for the infant.

With the object of still preserving a proper sense of proportion it must be stated that, although the mortality of illegitimate infants is from two to three times greater than that of the legitimate, it must be borne in mind that of the total births only about four per cent. are illegitimate; that the mortality of infants is highest in those localities where the greatest proportion of mothers go out to work away from home; and that the mortality of hand-fed as compared to breast-fed infants has been found by different observers to be five, ten, fifteen, twenty fold, and more.

From the foregoing, it is to be concluded that the main remedies required are, briefly: (1) The improvement of the health of the expectant mother; (2) the improvement of the health of the suckling mother; (3) the avoidance of premature weaning of the infant from the breast, especially during the summer months; and (4) the protection of the infant from cold, especially during the winter months. It will thus be seen that our knowledge regarding the ultimate causes of prevent-

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able infantile mortality, and of the remedies applicable, leads us to *converge upon the mother and the home*.¹

MUNICIPAL DUTIES AND POWERS

A Medical Officer of Health must inform himself, as far as practicable, respecting all influences injuriously affecting the public health within his district. Statistical returns made to him indicate that the health conditions of a proportion of expectant mothers are such as to lead to lowered vitality, disease, and death amongst the infants borne by them. By supplying instructions on advice cards, leaflets, or in other ways, it is hoped that helpful directions may fall into the hands of prospective mothers and nursing mothers. It should be the duty of medical practitioners, midwives, and midwifery students, as far as possible, to inquire into the condition of expectant mothers making application for attendance at parturition. Means may then be found to supervise their health from time to time during gestation, or, failing this, to notify all applications at public institutions to the Medical Officer of Health, so that he may provide for suitable supervision and instruction, and not leave ignorant and poverty-stricken applicants to struggle along without knowledge, advice, or assistance. At the end of gestation the Notification of Births Act brings a return of practically all births to the knowledge of the Medical Officer of Health. To the mothers of the newborn infants an advice card or leaflet can be sent forth-

¹ SYKES, J. F. J.: 'The Teaching of the Hygiene of the Expectant and Suckling Mother,' *Report of the Proceedings of the National Conference on Infantile Mortality*, June 1906. London: P. S. King & Son.

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with. This can be followed, when the professional attendant ceases to visit, at the end of a week or ten days, by the call of the Health Visitor.

The duties of the Health Visitor are to ascertain, in a tactful and sympathetic way, the circumstances of each case, making a subsequent note thereof, to advise the mother in all matters in which she needs advice, and to inform the mother of, and introduce her to, such institutions, associations, or persons, whose object is to meet the particular requirements of the case, and who have agreed to work in co-operation with the municipal authority.

Midwives must now be certified under the Central Midwives Board, and have to act in accordance with the Rules made by that Board, and approved by the Privy Council. They must send for medical help in all cases of illness of the patient or child, or of any abnormality occurring during pregnancy, labour, or lying-in; and also in the case of the infant, when there is any abnormality or complication such as injury, malformation, inflammation of eyes or navel, or dangerous feebleness or skin eruption. Certified midwives are supervised by county councils and county boroughs.

Infant Protection Visitors are appointed by local authorities to visit infants put out for nursing and maintenance for more than forty-eight hours, and the premises where they are received, in order to satisfy themselves as to the proper nursing and maintenance of the infants, and to give any necessary advice or direction. A large number of these infants are illegitimate. Infant Protection Visitors are appointed and supervised by county councils and county boroughs as local authorities.

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In some centres Committees of ladies are rendering valuable assistance. It is very necessary, however, to take care that only well-equipped women undertake visiting and practical work among the mothers of the poorer class.

PREVENTIVE MEASURES

The main reason for the persistence of a high infantile mortality is undoubtedly the want of proper maternal care and the increase in the artificial or hand-feeding of infants of suckling age. Early efforts directed towards the improvement of the lot of children embraced also the care of infants of suckling age in the day nurseries or crèches. But these institutions tended to facilitate a separation of mother and infant at a period when they should be inseparable, and to encourage a non-natural form of infant feeding which should only be adopted as a last resort when all other efforts have failed to obtain natural conditions. It is now recognized that premature weaning should not take place except under medical advice. Ninety or ninety-five per cent. of healthy working-class mothers are capable, I believe, *under normal hygienic conditions* of suckling their own infants. Certainly every effort should be made to prevent separation of a healthy mother from her suckling infant. There are unfortunately private day nurseries where little or no discrimination is observed in this important matter.

The establishment of milk dépôts for the distribution of modified milk for infants has tended to encourage mothers to wean their infants from the breast prematurely. Happily this is now being checked by the institution

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of medical consultations for mothers and infants. Some now provide meals for nursing mothers, in order to encourage breast-feeding. They also provide for the distribution of milk when the medical officer has advised weaning from the breast, and arrange for day-nursing in special cases found appropriate by the doctor. All such institutions require careful regulation in order to prevent abuse ; their value must rise or fall according to their method of administration.

Experience makes it desirable to strongly emphasize one point in connexion with the compilation of Advice Cards or Leaflets intended to be widely distributed to mothers. No information should be given on these which may in any way tend to the relinquishing of breast-feeding. No detailed instructions as to how to carry out the artificial feeding of infants should be distributed promiscuously. Any instructions as to hand-feeding, when necessary, should be given by the medical officer or practitioner to each individual mother requiring them, either verbally or on special printed forms, and, if printed, the mother's name should be written upon the regimen, prescribed in the same manner as for any other patient in an abnormal condition undergoing treatment.

The awarding of monetary prizes to mothers, after the Huddersfield method, seems to have quickened maternal virtue. Cautiously worded posters have been used in some places with advantage.

CO-OPERATING AGENCIES

The Medical Officer of Health should seek and obtain the co-operation of medical practitioners, midwives, mid-

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wifery students, private, provident, and public dispensaries, public hospital out-patient departments, relieving officers and district medical officers of the Guardians of the poor, labour bureaux, schools for mothers, consultations for nurslings, milk-dépôts and dairies, day nurseries and infant homes, maternity and nursing charities, and indeed all charitable organizations, both lay and religious, capable of aiding in the protection of infant life. The Health Visitor should be in close touch with all such agencies. The public health authority thus becomes the centre for the prevention of infantile mortality. With the least amount of expenditure, over-lapping, and loss of time, the greatest good is accomplished for the greatest number.

ANTICIPATIONS

The prevention of the destruction of the home, and the preservation of motherhood, must be our ideal. Carefully guarded alternative provisions must, for the present, be available for exceptional homes and abnormal mothers. These must be conducted under strict medical supervision.

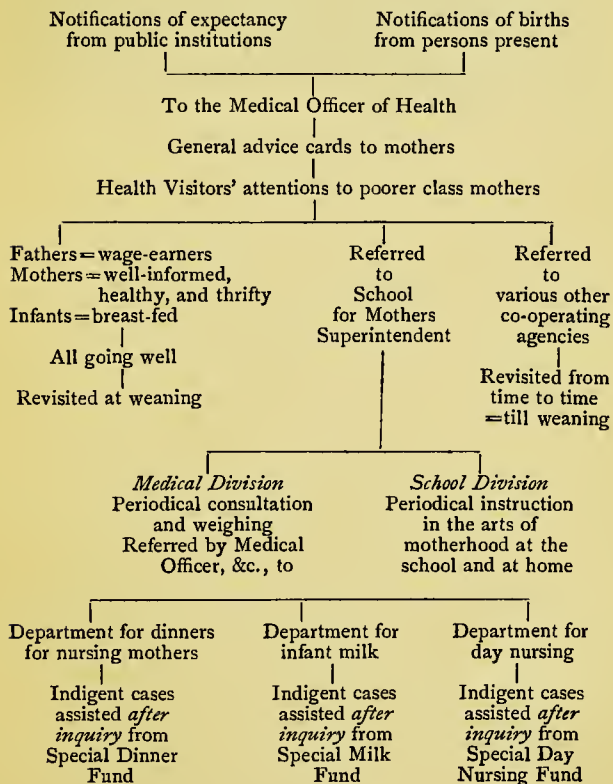
Expectant mothers applying at public institutions for attendance during their confinements form a class whose circumstances indicate that they require guidance and assistance. They willingly receive the sympathetic and helpful attention of a Health Visitor. If the managers and officers of public institutions would co-operate in obtaining such help by notifying applicants to the Medical Officer of Health or Health Visitors much benefit would accrue.

With the object of showing at a glance the organiza-

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tion which may be developed in conjunction with a public health authority the following chart has been constructed.

Scheme for the Prevention of Infantile Mortality



INFANTILE MORTALITY

Whatever may be our ideas upon prohibiting mothers from going out to work within the six months of parturition, or upon the endowment of motherhood, the fact remains that Nature has ordained that during the first six months of life, *at least*, the infant and mother are dependent and should not be separated. The arts of civilization, however, have led us far away, and we must return to nature if we hope to provide the State with infants and children capable of development into useful citizens.

MORAL ASPECTS
OF INFANT LIFE
PROTECTION

T. ARTHUR HELME,
M.D., M.R.C.P., F.R.S.E.

*Hon. Physician to the Man-
chester Northern Hospital for
Women and Children*

*There is but one Shekinah in the universe,
and that is the body of man.*

ST. CHRYSOSTOM.

*Few seem conscious that there is such a
thing as physical morality. . . . The fact
is, all breaches of the law of health are
physical sins.*

HERBERT SPENCER.

*Give us good motherhood and good pre-
natal conditions, and I have no despair for
the future of this or any other country.*

JOHN BURNS.

*Once the production of healthy, moral,
and intelligent citizens is revered as a
social service and made the subject of de-
liberate praise and encouragement on the
part of the Government, it will, we may be
sure, attract the best and most patriotic of
the citizens.*

SIDNEY WEBB.

*What is all our wealth and learning and
the finest flower of our civilization and our
Constitution? What are these and our
political theories but dust and ashes, if the
men and women, on whose labour the whole
social fabric is maintained, are doomed to
live and die in darkness and misery, in the
areas of our great cities?*

SIR H. CAMPBELL-BANNERMAN.

XII

MORAL ASPECTS OF INFANT LIFE PROTECTION

THE advance of preventive medicine with sanitary and other reform has brought about a progressive diminution of the general death-rate. Nevertheless, the death-rate amongst children in the first year of life is but a trifle less than it was fifty years ago, whilst the mortality of the first three months has actually increased. At the same time, the birth-rate has been steadily falling. Two other facts of far-reaching significance must be noticed : (1) the number of abortions and premature births is increasing ; (2) the standard of vitality is diminishing, or, in other words, congenital debility is increasing. Those influences which are at work leading to the birth of fewer, and resulting in the killing of many new-born babes, also leave many others, living it is true, but unfitted physically and mentally for the battle of life.

ANTE-NATAL DELINQUENCIES

The problems we have to face affect, not the dead alone, but the living.

It cannot be too forcibly insisted that the ante-natal influences which produce a falling birth-rate are to no small extent responsible for the maintenance of a high

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infantile death-rate, and for that lamentable increase of mortality in the earliest months of life, as well as for much of the physical deterioration which exists in all ranks of society.

The foundations of the constitution of a child are laid long before conception; but during the nine months of intra-uterine life—that is, the period during which the child develops within its mother's womb—factors are at work which profoundly affect the ultimate vitality of the child. Indeed, this period of life has crowded into it more potent influences than any subsequent period of a similar duration. There is no doubt the future well-being of a child is largely determined during its intra-uterine life.

THE CARE OF THE UNBORN CHILD

The care of the unborn child is of paramount importance. Unfortunately, public opinion in this matter is wrong. Ideas strangely at variance with experience are commonly met with, and the Press has been misled, and, in its turn, misleads. Even before the recent national inquiry regarding Physical Deterioration, evidence was given—though no proof was submitted or attempted—that, by virtue of some hypothetical and mysterious law of transmitted impulse, the unborn child fights strenuously for its own health at the expense of its mother's, and arrives in the world with a full chance of living a normal physical existence. The influence of such errors has been reflected in the literature on the hygiene of infant life, and finds voice in our Press, and in consequence one actually reads such views as the following: 'Medical opinion is pretty unanimous that

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nearly all children at birth are healthy ; and that, if the attention given them is ever so slightly on the right side instead of the wrong, they will live and flourish ' ! Errors of this kind, if unchallenged, must do a great amount of harm, and tend to direct efforts for amelioration into channels that are wrong, and lead to neglect of the essential point—i.e. the care of the unborn child.

Observation upon man and research upon animals (i.e. those by Professor Pinard in France, and Professor Noel Paton in Britain) have proved that adverse conditions during pregnancy deleteriously affect the offspring. The child of an underfed, ill-nourished mother does not 'arrive in the world with a full chance of normal physical existence,' but, on the contrary, it arrives heavily handicapped for the struggle.

Want of nourishment, intemperance, venereal disease, the taking of drugs, and other morbid conditions prejudicially affecting the mother, also deteriorate the child, so that, even if it enters the world alive, it brings with it a heavy incubus of incapacity and lessened vitality.

The care of the unborn child, then, is a matter of vital concern ; but, though the period of intra-uterine life is one fraught with possibilities of good or ill for the future health and vitality of the unborn child, let it be remembered that earlier still the destiny of that child was in the making, for at the moment of its conception there were impressed into its microscopic form the influences of past and present generations—influences which share in the determination of its physical and mental character, its form and structure, its possibilities and its limitations, its chances of life or death.

Conception is not, any more than birth, the beginning of life ; it is, like birth, merely a point or incident

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which marks the commencement of a fresh stage in the continuity of life.

LIFE BEFORE CONCEPTION

Before conception, influences which affect the destiny of a child are at work, consideration of which would lead us into the deep problems of heredity and hereditary disease. These problems are far from solved, and lie outside our present consideration. It is sufficient, however, to know that the child depends for its chance of health upon the germ-plasm of its immediate parents, and the recognition of this fact in relation to infant-life protection raises questions of grave public concern—e.g. health and disease in relation to marriage, including the question of the limitation of marriage to the physically and mentally fit. Whether the latter shall be brought about by the evolution of a healthy public opinion, or by legislation, is open to discussion. Our present customs are unsatisfactory, and are leading to a state of affairs the end of which may be national disaster. Can public opinion be successfully educated to cope efficiently with the evil? The question of legislation raises the spectre of the segregation of the unfit—a costly procedure, and one which frightens by its magnitude. On the other hand, an alternative which has been advanced, viz. the proposed sterilization of degenerates, is one which demands and deserves most careful consideration.

One cannot pass from this aspect of our subject without alluding to the effects of the so-called venereal diseases, especially syphilis. This disease carries with it disaster throughout the whole of life, from the moment

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of conception onwards. Though happily declining in frequency, it is still the cause of many abortions and premature and still births, and plays an important part in the production of degenerates and weaklings. Its elimination would result in a rise of the birth-rate and a fall in infantile mortality. For this we must depend chiefly upon education—education of the public as to its importance, and education of our children. Not indeed by prematurely forcing upon children knowledge which they ought not yet to know, with its danger of rousing a morbid curiosity, but, on the other hand, by teaching them, through graded steps, the simple physiology of life. Then, when the time comes, and the evolution of their natural endowments warrants it, their parents or their teachers, ever on the look out for the sign, may explain and instruct, and, if need be, warn in harmony with the stage of growth at which the child or budding youth has arrived.

Legislation is a thorny question, but I see no reason why syphilis and other venereal diseases should not be notifiable.

THE HYGIENE OF INTRA-UTERINE OR ANTE-NATAL LIFE

The period of intra-uterine life is fraught with endless possibilities for the unborn child. Measures for the protection of infant life now centre around the expectant mother, her environment, food, drink, and occupation. It is well for us to note the attitude of the public towards the value of foetal life and the rights of the unborn child.

Amongst uncivilized peoples, even of recent times, and probably equally amongst the primitive races of

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prehistoric times, a very low estimate was placed upon the value of the life of the unborn child ; the right of a child to live was dependent upon the available food-supply. One writer says : ' Our ancestors did not admit a new-born infant had a right to existence. The mother had let it fall to the ground ; there it must remain until the head of the family either picked it up himself or permitted others to do so. Before he gave the sign, the object counted as little more than a clod ; it was as yet but so much organic clay.' And further : ' When a woman found herself to be pregnant, and saw that there was no probability that the infant would be a welcome addition to the family circle, she in many cases had recourse to the production of abortion.' This practice undoubtedly is common amongst primitive peoples.

When we look into the history of the civilized nations we find evidence that the practice similarly prevailed. In the oldest medical work in existence, that is, the Egyptian papyrus of Ebers, B.C. 1550, we find directions for the production of abortion, a receipt being given ' to detach or disperse the foetus in the womb ' ; and even before this the practice must have existed, for it was forbidden by Zoroaster, and in later times was again forbidden in the Hippocratic Oath (B.C. 468).

From the earliest times, then, among civilized nations, we may take it that the right of the foetus to live has always been recognized, and the right of the parents to take away that life has never been allowed ; nevertheless, the practice of procuring abortion prevailed.

We are to-day not much more advanced : the right of the foetus to live is recognized by the State, but what do we see in practice ? There is no doubt that

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an important cause of foetal mortality to-day is the artificial induction of abortion. There is equally no doubt that the public do not, even now, place a proper estimate upon the life of the unborn child, and ignorance of the fact that the child in the womb from the day of its conception is as much a living being, with its individual rights, as at any future period of its existence, is doubtless responsible for much of the destruction of intra-uterine life that is happening to-day.

From the economic standpoint, the value of the life of the child *in utero* is enhanced by the present fall in the birth-rate; since fewer children are being born, it follows that the life of the child *in utero* is becoming of higher value, and that it is becoming of greater importance that that life shall be preserved. We must recognize the appreciation in value of foetal life and the inalienable right of the unborn child to its life.

FOETAL MORTALITY AND MORBIDITY

It is an accepted fact that foetal mortality, i.e. the mortality of the child before birth, *exceeds* that of any other period of life. Probably, too, foetal morbidity occupies a similar position relative to that of any other period of life, and leads to much post-natal or 'post-poned' infantile mortality; and, short of actual post-natal death, the same ante-natal causes, which make for this diminished viability, leave their permanent marks upon the individuals born, in the form of diminished vitality or 'congenital debility.' They may not be sufficiently powerful to lead to death, but they so lower the vitality of the child that it falls an easy prey to the causes of death, to which a child of normal health would

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not succumb, or becomes a less useful member of society by reason of its 'congenital debility.'

As John Burns tersely puts it, 'the causes which carry so many away leave so many behind unfitted for the life before them.' I am convinced that, just as the foetal death-rate is a growing rate, so is there amongst the children born alive a steadily increasing *diminution of vitality due to ante-natal causes*.

In support of this, we find that the average number of infants dying from the accidents of birth, congenital defects, and premature birth, &c., shows a steady upward movement, whilst there is also a steady increase in still-births and abortions.

It is, further, a most significant fact that this increase in deaths from premature birth coincides with a fall in the general birth-rate, the same causes being responsible for both.

DIMINUTION OF BIRTH-RATE

The great diminution of the birth-rate demands attention. The fall is not entirely due to increased foetal mortality ; other factors are at work.

The increasing relative sterility of marriage, whether voluntary or unintentional, is a matter of concern, for I am convinced of the harmfulness of the modern acceptance of Malthusian doctrines, and I am equally convinced that the practice of criminal abortion is a growing one.

If the result of the falling birth-rate and the rising death-rate were to be the evolution of a numerically smaller, but physically greater, race, i.e. the substitution of small and healthy families for larger families of un-

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healthy members, something might be said in its favour on economic grounds. Unfortunately, this is not so. We are getting smaller families of less healthy children.

PROTECTION OF ANTE-NATAL LIFE

To ensure the supply of healthy children it is not enough to begin with the child when born: the causes of disease were at work long before, and we must begin with the child unborn. We must look to the surroundings of the child during its formation. This resolves itself into the proper care of the expectant mother.

During the whole of its intra-uterine life the child derives its food—its whole food and its only food—from the mother's blood and tissues. The state of the mother's health and of her blood must profoundly affect the child within her womb. If these are good, it will be well for the child; if these are bad, whether as the result of poverty, starvation, and overwork, or as the result of injudicious food, excess, or irregularity of life, it will be bad. It is an established physiological observation that the healthy development of the child depends upon the healthy performance of its mother's functions. The care and surroundings of the expectant mother are matters of the highest physiological importance.

We have in the past approached these and other matters too much from the standpoint of their influence upon the mother. A radical change would seem desirable, and I would urge the paramount necessity of regarding them from the standpoint of their influence on the unborn child: we must recognize the *right of*

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the unborn child to conditions which shall make for the safeguarding of its health.

And now as to certain practical suggestions :

1. *Food*.—It is impossible for a half-starved woman to give her unborn child its fair and proper chance. If an unborn child has any moral rights at all, surely these cry out that we, as a State, shall make such provision that any necessitous expectant mother can have the nourishment required for the due development of her child !

2. *Work*.—Overwork, associated, as it often is, with poverty and want of food, is a fruitful source of injury to the unborn child. Unrestricted factory work, or work under any unfavourable condition, is not only injurious to the pregnant woman, as subjecting her to the risks of premature confinement and prejudicing her health so as to render her less fitted to undergo the strain of pregnancy and suckling, but there can be no doubt that it equally affects the unborn child, both by causing its premature birth and injuriously affecting its vitality.

The remedy for this is that the State should make abstention from work by pregnant women compulsory, and should provide for their wants in cases of necessity. This encroaches upon the so-called 'rights of women'; but the unborn child has its rights, and this question should be dealt with in view of the rights of one who cannot help itself; for every woman who becomes an expectant woman *ipso facto* ceases to be a unit with her individual rights and independent interests: these she has voluntarily surrendered in favour of that new life within her, of whose interests she is the guardian.

3. *Alcohol and Habits of Life*.—It is impossible to

INFANT LIFE PROTECTION

avoid alluding to the fact that alcoholism is the direct cause of disease and death before the child is born, and, short of this, of such ante-natal disease and deformity as lead to much infantile mortality after birth. As the surroundings and mode of life of the expectant mother profoundly affect her child, it is her duty to so order her life as to favour the proper development of her child: abstinence from alcohol during pregnancy and lactation is most desirable. Professor von Bunge has collected much evidence to show that an alcoholic inheritance is answerable for the failure of the powers of lactation in many women.¹

THE MORAL ASPECTS OF INFANCY, OR POST-NATAL LIFE

The three chief causes of the maintenance of a high infantile mortality are prematurity, diarrhoea, and lung disease. The influences responsible for the first group were acting through the mother before the child was born. These same influences affect the other two, but in addition there are causes acting after birth, i.e. unsatisfactory feeding and want of proper care—in other words, defective motherhood.

To find a remedy for defective motherhood is a matter of intricate complexity. Vast problems are involved. The housing of the poor is a vital matter, but

¹ BUNGE : *Alcoholergiftung und Degeneration*. Leipsic. 1904. English translation, *Alcoholic Poisoning and Degeneration*. London. 1905.

Quoted also in *Infantile Mortality and Infants' Milk Dépôts*, by Dr. G. F. McCleary (London. 1905); and in *The Alcohol Problem in its Biological Aspect*, by Dr. T. N. Kelynack (London: R. J. James. 1906).

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the solution of this question will not solve the problem of infantile mortality. Poverty is a vital matter, but higher wages alone will not solve our problem, for in times of prosperity the deaths of infants rapidly increase. Legislative measures for the protection of infants and for the control of the milk-supply, and all measures of social reform which have for their object the betterment of the poor, demand our constant support ; but among and above all stands the great question of motherhood.

The mother is the central pivot, upon which all else rests. By the will of God, to her has been entrusted the fashioning and moulding of her child, and, even when it attains a separate life, nothing can adequately replace a mother's care. We must not forget that 'physical separation' does not, as some one has said, mean 'physiological independence.' To the mother's nature has been assigned the continued duty and responsibility (and normally one may add the supreme joy) of the personal nourishment and care of her offspring, and nothing can rightly replace it.

Unfortunately, this moral sense of duty and responsibility sometimes does not exist ; its place is taken by apathy and indifference. More frequently still, it is ignorance—ignorance of the most elementary facts in connexion with the duties and responsibilities of motherhood. Under present conditions the girl children of our working classes compulsorily attend school, where the most obvious requirements in their training are apt to be neglected. At as early an age as possible the girl drifts off to work, and, in too many instances, without any knowledge of domestic or hygienic affairs, except possibly a smattering picked up at home (a smattering too often worse than useless), she contracts

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a marriage, and at once assumes the duties of parentage, for which she is neither mentally nor physically fit. No wonder that our infantile mortality and degeneracy advance! It is the mental and physical unfitness of parents that lies at the root of so much sin and suffering and death.

Whatever we do, if we neglect the moral aspect of the responsibilities of parentage, and especially motherhood, we must pay the penalty of racial decay.

There is no great mystery in this problem of the protection of infant life. The infant's life depends in the first instance upon the vitality it gets from its mother, and, after that, upon the proper fulfilment of its needs as regards air, food, warmth, and cleanliness. For these it is dependent upon the health, intelligence, and devotion of its mother, and, indirectly, of its father.

The standard of the home life must be raised. Fatherhood and motherhood must be entered upon with a due recognition of the moral duties and responsibilities entailed.

APPENDICES

CONSISTING OF REFERENCES
TO ILLUSTRATE THE PRE-
CEDING CHAPTERS

APPENDICES

IN the following appendices an attempt has been made to furnish the serious student with such information and direction as shall lead to specialized study and practical service. The Editor will count it a favour if readers will inform him of all sins of omission and commission.

APPENDIX I

To illustrate Chapter I

IN addition to works enumerated in subsequent appendices, the following are likely to be of value for reference :

- BAINBRIDGE, W. S. : *Life's Way*. New York : Frederick A. Stokes Co. 1909.
- CAUTLEY, E. : *On the Natural and Artificial Methods of Feeding Infants and Young Children*. Second edition. London : J. & A. Churchill. 1903. 7s. 6d.
- CRADOCK, H. C. : *The Care of Babies*. London : George Bell & Sons. 1908. 6d.
- GOODHART, J. T., and STILL, G. F. : *The Diseases of Children*. Eighth edition. London : J. & A. Churchill. 1905. 12s. 6d. net.
- GORDON, W. : *The Modern Mother*. London : T. Werner Laurie. 1909. 6s. net.

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- GRIMSHAW, J. : *Health Talks about Children*. Birkenhead. 1906. 1s. net.
- GRIMSHAW, J. : *Your Child's Health*. London : J. & A. Churchill. 1908. 2s. 6d. net.
- JOHNSTON, J. : *Wastage of Child Life*. Second edition. Manchester : John Heywood, Ltd. 1908. 6d. net.
- KEEBLE, S. E. : *The ABC Annotated Bibliography on Social Questions*. London : R. Culley. 1907. 1s. net.
- KELYNACK, VIOLET : *Alcohol and Motherhood*. London : R. J. James. 1908. 1d.
- KERLEY, C. G. : *Treatment of the Diseases of Children*. Philadelphia and London. 1907.
- KERR, LE GRAND : *The Baby: its Care and Development*. New York : Albert T. Huntington. 1908. \$1 net.
- OPPENHEIM, N. : *The Care of the Child in Health*. New York : The Macmillan Co. 1900.
- PARR, R. J. : *The Baby Farmer*. London : National Society for the Prevention of Cruelty to Children, 40 Leicester Square, W.C. 1908. 6d. net.
- SIMS, G. R. : *The Black Stain*. London : Jarrold & Sons. 1907. 1s. net.
- SIMS, G. R. : *The Cry of the Children*. London : Tribune Office. N.D. 1d.
- SMITH, EUSTACE : *A Practical Treatise on Disease in Children*. Third edition. Edinburgh and London : William Green & Sons. 1909. 21s. net.
- SPARGO, J. : *The Bitter Cry of the Children*. New York : The Macmillan Co. 1906.
- STILL, G. F. : *Common Disorders and Diseases of Childhood*. London : Henry Frowde and Hodder & Stoughton. 1909. 15s. net.
- WASHBURNE, M. F. : *The Mother's Year Book*. New York. The Macmillan Co. 1908.

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Reference may be made to the following periodical literature :

Archives of Pediatrics : New York : E. B. Treat & Co.
\$3 annually.

Child Study. The journal of the Child Study Society.
Published quarterly by E. Arnold, 41 & 43
Maddox Street, Bond Street, London, W. 6d. net.

Child's Guardian. The organ of the National Society
for the Prevention of Cruelty to Children, 40
Leicester Square, London, W.C. Monthly. 1d.

Eugenics Review. Published quarterly by the Eugenics
Education Society, 6 York Buildings, Adelphi,
London, W.C. 1s. net.

Journal of the Royal Sanitary Institute. London :
Offices of the Royal Sanitary Institute, 90 Bucking-
ham Palace Road, S.W. Monthly. 1s. net.

Progress. The organ of the British Institute of Social
Service, 11 Southampton Row, London, W.C.
Quarterly. 6d.

*Reports of the Society for the Study of Diseases in
Children*. Edited by George Carpenter, M.D.
London : J. & A. Churchill. 12s. 6d. per vol.

The Midwives' Record and Maternity Nurse. London :
Baillière, Tindall & Cox. Monthly. 2d.

The Parents' Review. Edited by Charlotte Mason.
London : Parents' National Educational Union,
26 Victoria Street, S.W. Monthly. 6d.

The Survey. The weekly official organ of the Charity
Organization Society of the City of New York,
105 East 22nd Street. \$2 annually.

Numerous works dealing with the problems of Infant
Life will be found in the many readily accessible libraries

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of London : See *The Libraries of London*, published by the University of London, 1908. 6d. net. The libraries in connexion with the following will be of special service :

The British Institute of Social Service, 11 Southampton Row, W.C.

The Charity Organization Society, Denison House, 296 Vauxhall Bridge Road, S.W.

Lewis's Medical and Scientific Library, 136 Gower Street, and 24 Gower Place, W.C.

The Medical Society of London, 11 Chandos Street, Cavendish Square, W.

The National Health Society, 53 Berners Street, W.

The Royal College of Surgeons, Lincoln's Inn Fields, W.C.

The Royal Society of Medicine, 20 Hanover Square, W.

With regard to the treatment of sick infants, medical advice should always be obtained. Every organization dealing with charity, and working for social welfare, should have a medical adviser connected with it. In some instances the Medical Officer of Health may be consulted with advantage. Lists of all British hospitals dealing with infants and children will be found in *The Medical Directory*, issued annually by J. & A. Churchill, 7 Great Marlborough Street, London, W. 14s. net. Much information may be obtained from *Burdett's Hospitals and Charities*, published every year by the Scientific Press, Ltd., 28 & 29 Southampton Street, Strand, London, W.C. 7s. 6d. net. *The Annual Charities Register and Digest*, prepared every year for the Charity Organization Society, Denison House, Vauxhall Bridge Road, London, S.W., and published by

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Longmans, Green & Co., 39 Paternoster Row, London, E.C., 5s. net., is indispensable for social workers.

The Infants' Hospital, Vincent Square, Westminster, S.W., deals with cases of infantile malnutrition, and here probationers are trained in the management of babies. All Health Visitors should possess practical acquaintance with the proper methods of caring for infants.

Much useful information may be obtained in *The New Encyclopaedia of Social Reform*, and its *British Supplement*. London and New York: Funk & Wagnalls Co. 1908.

A useful Bibliography on Child Life will be found in DR. MARGARET ALDEN's *Child Life and Labour*. London: Headley Bros., Bishopsgate Street Without, E.C. 1908. 1s. net.

The problems which circle around and centre in Infancy should be studied by all Christian Social Unions. The following list of organizations, together with their Secretaries' names and addresses, as given in Mr. Malcolm Spencer's *Social Reclamation: A Study in Service* (London: Student Christian Movement, 93 & 94 Chancery Lane, W.C. 1909. 1s.), will be useful:

The Christian Social Brotherhood. W. Reason, M.A.,
Macdonald Road, New Southgate, N.

The Christian Social Union. Rev. P. Dearmer, 102
Adelaide Road, N.W.

The Friends' Social Union. Percy Alden, M.P., 'Mansfield,' Loughton, Essex.

The League of Progressive Thought and Social Service.
F. R. Swan, 27 Chancery Lane, W.C.

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- The National Conference Union for Social Service. R. P. Farley, 11 Algernon Road, Kilburn, N.W., and Miss Catherine Giltins, Salisbury Road, Leicester.
- The National Union for Christian Social Service. 34 Paternoster Row, E.C.
- The Presbyterian Social Service Union. Rev. G. A. Wilson, M.A., 91 Grove Park, Camberwell, S.E.
- The Primitive Methodist Social Service Union. Rev. Samuel Horton, Thornleigh, Promenade Road, Fleetwood, Lancs.
- The Scottish Christian Social Union. Rev. C. Rolland Ramsey, 102 Bath Street, Glasgow.
- The Wesleyan Methodist Union for Social Service. Rev. W. F. Lofthouse, M.A., Friary Road, Handsworth, Birmingham.
- The Yearly Meeting Committee on Social Service (Friends). Miss Lucy Gardner, 75 Sandringham Road, Dalston, N.E.

APPENDIX II

To illustrate Chapter II

FOR an elaboration of the subject of the Anatomy and Physiology of the Infant the reader may be referred to Professor J. B. Hellier's manual on *Infancy and Infant Rearing*. Second edition. London : Charles Griffin & Co. 1908. 2s. 6d. net.

Full particulars regarding the structure and functions of infants will be found in such authoritative and readily accessible works as the following :

ASHBY, H., and WRIGHT, G. A. : *The Diseases of Children : Medical and Surgical*. Fifth edition. London : Longmans, Green & Co. 1905. 21s. net.

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- FORSYTH, DAVID : *Children in Health and Disease*.
London : John Murray. 1909. 10s. 6d. net.
- HOLT, L. EMMETT : *The Diseases of Infancy and Childhood*. Fourth edition. London : Sidney Appleton.
1907. 25s. net.
- KEATING, J. M. : *Cyclopædia of the Diseases of Children, Medical and Surgical*. 4 vols. 1889-90. 22s. 6d. net each. Supplemental Vol. V. 1901. 25s. net.
- ROTCH, T. M. : *Pediatrics*. Fifth Edition. Philadelphia and London : J. B. Lippincott Company.
1906. 25s. net.
- VINCENT, RALPH : *The Nutrition of the Infant*. Second edition. London : Baillière, Tindall & Cox. 1904.
10s. 6d. net.

For purposes of reference the English translation of PFAUNDLER and SCHLOSSMANN'S *Diseases of Children*, in four volumes (Philadelphia and London : J. B. Lippincott Company. 1908), will be found of service.

For information on psychological development, see PREYER, *The Mind of the Child*. Translated by H. W. Brown. International Scientific Series.

APPENDIX III

To illustrate Chapter III

THE following works will be of service for reference respecting the Hygiene of Infancy :

- ASHBY, H. : *Health in the Nursery*. 7th Edition.
London : Longmans, Green & Co. 5s.
- BARRETT, HOWARD : *The Management of Children*.
London : George Routledge & Sons, Limited.
1906.

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- CRADOCK, H. C.: *The Care of Babies*. London: George Bell & Sons. 1908. 6d. net.
- GRIMSHAW, J.: *Your Child's Health*. London: J. & A. Churchill. 1908. 2s. 6d. net.
- KERR, LE GRAND: *The Baby: its Care and Development*. New York: Albert T. Huntington. 1908. \$1.00 net.
- LISTER, T. D.: *Chevasse's Advice to a Mother*. 16th Edition. London: J. & A. Churchill. 1906. 2s. 6d. net.
- MORTEN, HONNOR: *A Complete System of Nursing*. 3rd Edition. London: Dent. 1898. 7s. 6d. net.
- VINCENT, R: *Lectures on Babies*. London: Baillière, Tindall & Cox. 1908.
- WASHBURNE, M. F.: *The Mother's Year Book*. New York: The Macmillan Co. 1908.

Many of the publications of the National Health Society, 53 Berners Street, Oxford Street, London, W., will be of service to social workers. See also the publications of the Women's National Health Association of Ireland, and its official organ *Slainte*.

APPENDIX IV

To illustrate Chapter IV

MUCH detailed information concerning the Feeding of Infants will be found in the standard works on infancy and childhood, and in many of the books mentioned in the accompanying appendices.

For convenient and up-to-date descriptions of modern methods the following may be recommended :

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- DINGWALL-FORDYCE, A.: *Diet in Infancy*. Edinburgh and London: William Green & Sons. 1908. 3s. 6d. net.
- FOWLER, J. S.: *Infant Feeding*. London: Henry Frowde and Hodder & Stoughton. 1909. 5s. net.
- MCCAW, JOHN: *Aids to Infant Feeding*. London: Baillière, Tindall & Cox. 1903. 2s. 6d.
- PRITCHARD, E.: *Infant Education*. London: Henry Kimpton. 1907.
- SYMES, W. N.: *Notes on the Feeding of Infants*. Dublin: Fannin & Co. 1899.
- THOMSON, J.: *Guide to the Clinical Examination and Treatment of Sick Children*. Second edition. Edinburgh and London: William Green & Sons. 1908. 12s. 6d. net.

Details regarding the composition of a large number of popular infants' foods will be found in DR. R. HUTCHISON'S *Food and Dietetics* (London: Arnold. 1906). See table reproduced in DR. JOHN THOMSON'S work on *Clinical Examination and Treatment of Sick Children* (Second edition. pp. 550. Edinburgh and London: William Green & Sons. 1908. 12s. 6d. net), and also in DR. DINGWALL-FORDYCE'S *Diet in Infancy* (pp. 157. Edinburgh and London: William Green & Sons. 1908. 3s. 6d. net).

APPENDIX V

To illustrate Chapter V

FULL descriptions of the common disorders of infancy, with particulars as to their prevention, are to be found in most of the recognized text-books on diseases of children.

APPENDICES

The following may be noted as being likely to be of special service :

ASHBY, H., and WRIGHT, G. A. : *The Diseases of Children*. 5th Edition. London : Longmans, Green & Co. 1905. 25s.

CHEADLE, W. B. : *Principles and Exact Conditions to be Observed in the Artificial Feeding of Infants*. 6th Edition, edited by Poynton, F. J. London : Smith, Elder & Co. 1906. 5s.

DINGWALL-FORDYCE, A. : *Diet in Infancy*. Edinburgh and London : W. Green & Sons. 1908. 3s. 6d.

Many municipal health authorities issue posters and leaflets respecting some of the more prevalent disorders of infancy. Social workers will do well always to communicate with the Medical Officer of Health of their district for guidance.

Some hospitals for children provide convenient cards of instruction to parents and others bringing infants to their out-patient departments.

The National Health Society (53 Berners Street, Oxford Street, London, W.), and the National League for Physical Education and Improvement (11 Southampton Row, Russell Square, London, W.C.), publish serviceable tracts suitable for distribution.

APPENDIX VI

To illustrate Chapter VI

THE number of Schools for Mothers at present existing in the United Kingdom is very small, but fortunately they are being rapidly multiplied. The following may

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well be visited by those practically interested in the movement :

London : St. Pancras School for Mothers, 37 Chalton Street, N.W.

Fulham—92 Greyhound Road, S.W.

Lewisham—Greyladies, Dartmouth House, Greenwich, S.E.

Rotherhithe—Bermondsey Settlement, Farncombe Street, S.E.

Stepney—587 Commercial Road, E.

Belfast: Babies' Clubs—(1) 37 Divis Street ; (2) 257 Newtownards Road ; (3) 48 York Street ; (4) 14 Boyne Square.

Birmingham : The Farm, Sparkbrook, River Street.

Bolton : Thomasson Reading Room, Crompton Street.

Cork : Lady Carbery, Frankfield House.

Manchester : The Girls' Institute, Mill Street, Ancoats.

Newcastle : 20 Wharnccliffe Street.

Nottingham : 6 Howard Street.

Wimbledon : Town Hall.

Among the institutions abroad which are carrying on work similar to the British School for Mothers movement, reference may be made to the following :

Berlin : Professor Neumann's School, Blumenstrasse.

Ghent : Dr. Miele's, 28 Rue van Hulthem.

Paris : Mutualité Maternelle, 52 Rue St. Sauveur.

Potsdam : Professor Keller's Clinic, Kaiserin Augusta Institute.

Full particulars regarding the St. Pancras institution will be found in *A School for Mothers*. London: Horace Marshall & Co. 1908. 1s.

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Many articles dealing with Schools for Mothers and similar institutions have recently appeared in medical and humanitarian journals, and the following references may be of service :

MCDUGALL, LADY ELLEN M. : *Mothers in Council*.
London : Robert Culley. 1908. 2s. 6d.

BUNTING, EVELYN M. : ' The Education of Mothers ' in
Social Science and Service. London : Robert Culley.
1909. 1s. net.

HEATH, H. L. : *The Infant, the Parent, and the State*.
London : P. S. King & Son. 1907. 3s. 6d. net.

Much information will be obtained from the official reports and publications of the institutions already at work. See particularly :

First and Second Annual Reports of the St. Pancras School for Mothers. London. 1908 and 1909.

APPENDIX VII

To illustrate Chapter VII

MUCH information respecting French crèches and German krippen, both being forms of day nurseries, will be found in the *Report on Infantile Mortality* by Dr. S. G. H. MOORE, Medical Officer of Health for Huddersfield. All interested in the establishment and conduct of day nurseries should consult this valuable collection of comparative data.

The most informing record available concerning existing crèches in the United Kingdom and abroad is the Report of the Chief Officer of the Public Control

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Department of the London County Council on *Crèches or Day Nurseries*. London : P. S. King & Son, 2 and 4 Great Smith Street, Victoria Street, Westminster, S.W. 1905. 9d.

The National Society of Day Nurseries (offices : 1 Upper Montague Street, Russell Square, London, W.C.), founded in 1906, provides a central organization for the purpose of raising the standard of crèches throughout the United Kingdom, and serves as a medium of communication between existing day nurseries by affiliating them and providing practical assistance. The following crèches have been started under the auspices of the Society :

The Princess Christian Hammersmith Day Nursery,
135 Blythe Road, W. ;

The Fulham Day Nursery, 56 Harwood Road, S.W. ;

The Wyndham Day Nursery, 212 Camberwell New Road, S.E. ;

The South Acton Day Nursery, 62 Stafford Road, W. ;

George Street Day Nursery, and three others in Dundee ;

Toxteth Day Nursery, 5 Wesley Street, Liverpool ;

Also in Edinburgh, Carlisle, Cairo, Alexandria, &c.

Girls desirous of becoming children's nurses can receive a thorough and practical training at the three undermentioned crèches affiliated to the Society, viz. :

Douglas Day Nursery, 114 Shepherdess Walk, Hoxton ;

Fulham Day Nursery, 56 Harwood Road, Fulham ;

Wyndham Day Nursery, 212 Camberwell New Road.

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Probationers are received from the age of fourteen, for three or six months' training, according to their age or previous experience. Candidates pay a fee for their board and lodging, and provide their own uniform. (Fees vary at the different crèches.) All particulars can be had from the matrons of the above-mentioned crèches or from the Inspector of Crèches for the National Society of Day Nurseries.

The Crèche is the official organ of the National Society of Day Nurseries, and this, with *Hints on How to Start a Crèche* and other publications of the Society, affords helpful direction as to the initiation and management of a day nursery.

Day nurseries are connected with missions and other institutions both in London and the larger centres in the provinces. Sister Hope has established a crèche in connection with the West London Mission at 60 Greek Street, Soho, W.

A list of the day nurseries at work in London appears in *The Annual Charities Register and Digest* of the Charity Organization Society, Denison House, Vauxhall Bridge Road, S.W. London: Longmans, Green and Co. 1909. 5s. net.

For details regarding management see such works as:

BUDIN, P.: *The Nursling: The Feeding and Hygiene of Premature and Full-term Infants*. English translation by W. J. Maloney. London: The Caxton Publishing Co. 1907. 21s. net.

HEATH, H. L.: *The Infant, the Parent, and the State: A Social Study and Review*. London: P. S. King & Son, 2 and 4 Great Smith Street, Victoria Street, Westminster, S.W. 1907. 3s. 6d. net.

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APPENDIX VIII

To illustrate Chapter VIII

NUMEROUS works and articles, in English and other languages, dealing with milk dépôts and like institutions have appeared during the last few years, but the following select bibliography will furnish all that practical workers in this country will require :

- BUDIN, P. : *The Nursling*. Translated by W. J. Maloney. London : Caxton Publishing Co. 1907. 21s. net.
- DODD, F. L. : *The Problem of the Milk Supply*. London : Baillière, Tindall & Cox. 1904. 1s. 6d. net.
- DUFOUR, LEON : *Comment on Crée une Goutte de Lait*. Fécamp. 1902.
- FOWLER, J. S. : *Infant Feeding*. London : Henry Frowde and Hodder & Stoughton. 1909. 5s. net.
- HARRIS, F. DREW : 'The Supply of Humanized Sterilized Milk in St. Helens,' *British Medical Journal*, August 18, 1900.
- HEATH, H. L. : *The Infant, the Parent, and the State*. London : P. S. King & Son. 1907. 3s. 6d. net.
- MCCLEARY, G. F. : *Infantile Mortality and Infants' Milk Dépôts*. London : P. S. King & Son. 1905. 6s. net.
- NEWMAN, G. : *Infant Mortality*. London : Methuen & Co. 1906. 7s. 6d. net.
- SPARGO, J. : *The Common Sense of the Milk Question*. New York : The Macmillan Co. 1908. 6s. 6d. net.
- STRAUS, N. : *The Influence of a Pure Milk Supply on the Death Rate of Children*. New York. 1897.

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- SWITHINBANK, H., and NEWMAN, G.: *Bacteriology of Milk*. London: Murray. 1903. 25s. net.
- VINCENT, R.: *Lectures on Babies*. London: Baillière, Tindall & Cox. 1908. 2s. 6d. net.
- VINCENT, R.: *The Nutrition of the Infant*. Second edition. London: Baillière, Tindall & Cox. 1904. 10s. 6d. net.
- WINSLOW, K.: *Production and Handling of Clean Milk*. London: Baillière, Tindall & Cox. 1908. 10s. 6d. net.

The following may also be consulted with advantage :
The Practitioner for October, 1905 (special number).
London: The Practitioner, Ltd. 1905.
Report of the National Conference on Infantile Mortality, 1906. London: P. S. King & Son. 1906.
Reports of the Medical Officers of Health of Liverpool, 1901-8 (especially 1906); Battersea, 1902-8; Glasgow, 1903-8; Finsbury, 1904-8; Sheffield, 1908; and St. Helens, 1900.

APPENDIX IX

To illustrate Chapter IX

REFERENCES to the legal protection of infants will be found in many of the larger works dealing with child-life generally and mentioned elsewhere in this volume. Among works and articles likely to be of special service the following may be indicated :

- ALDEN, MARGARET: *Child Life and Labour*. London: Headley Brothers. 1908. 1s.
- ATKINSON, S. B.: *Life, Birth, and Live-birth*. *Law Quarterly Review*. 1904.

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- BARRETT, R. M.: *Foreign Legislation*. Dublin. 1896.
HALL, W. CLARKE: *Law relating to Children*. London : Stevens. 1905. 8s. 6d.
MADDISON, A. J. S.: *Law relating to Child-saving and Reformatory Efforts*. London : Reformatory and Refuge Union. 1906. 2s. 6d.
NEWMAN, GEORGE: *Infant Mortality*. London : Methuen. 1906. 7s. 6d. net.

Much valuable information regarding the legal aspects of infant life protection will be found in such official documents as have been published in connexion with the following Parliamentary inquiries :

- On the Children Life Insurance Bill. 1890-1.
On Death Certification. 1893.
On the Infant Life Protection Bill and Safety of Nurse Children Bill. 1896.
On the Infant Life Protection Bill. 1890.
On Physical Deterioration. 1904.
On the Poor Laws and the Relief of Distress. 1909.
On Poor Law Children. 1896.
On the Working of the Midwives Act. 1909.

Numerous papers of practical service will also be found in reports of various conferences, such as :

- Proceedings of the Third International Congress for the Welfare and Protection of Children*. London : P. S. King & Son. 1902. 2s. 6d. net.
Legislation in regard to Children. P. S. King & Son. 1906. 1s.
National Conferences on Infantile Mortality. 1906 and 1908. P. S. King & Son. 1s. 6d. net.

APPENDICES

The Children Act of 1908 has given rise to an extensive literature, mainly annotations of or works explaining the application of the Act. Among them the following may be recommended :

- ATHERLEY-JONES, L. A., and BELLOT, H. H. L. : *The Law of Children and Young Persons (in relation to penal offences) including the Children Act, 1908.* London : Butterworth & Co. 1909.
- BONNER, J. : *Protect the Children.* London : United Kingdom Band of Hope Union. 1909.
- CARTER, H. : *The Children Act Explained.* London : Robert Culley. 1909. 1d.
- GENTLE, W. B., and RAWLINGS : *The Police Officer's Guide to the Children's Act, 1908.* London : Effingham Wilson. 1909. 1s. 6d. net.
- GREGORY, A. E. : *The Children Act, 1908 : Notes and Suggestions.* London : National Children's Home and Orphanage. 1909. 1d.
- INGLIS, M. K. : *The Children's Charter.* London : Nelson & Sons. 1909. 6d.
- NEWTON, J. : *The Children's Charter : Some of the Provisions of the New Act.* London : Children's Protection League. 1909.
- REED, SIR A. : *The Children's Charter.* Dublin : Church of Ireland Temperance Society. 1909. 1d.
- WOOD, H. K. : *Provisions of the Children Act, 1908, Examined and Explained.* London : W. P. Griffith & Sons. 1909.

The publications of the following should also be consulted :

State Children's Association : 58 Old Broad Street, E.C.

APPENDICES

National Society for the Prevention of Cruelty to Children : 40 Leicester Square, W.C.

The Sociological Society's Review. The organ of the Sociological Society : 24 Buckingham Street, Strand, W.C.

The Eugenics Review. Published quarterly by the Eugenics Education Society : 6 York Buildings, Adelphi, W.C. 1s. net.

APPENDIX X

To illustrate Chapter X

THE literature dealing with the national aspects of Infant Life is now considerable and daily increasing. The following are references to some of the more important works which will be of service to those desirous of studying this matter more fully :

Annual Summary of Marriages, Births, and Deaths in England and Wales, and in London. 1908. London : Darling & Son.

Forty-fifth Detailed Annual Report of the Registrar-General of Ireland for 1908. Dublin : Alexander Thom & Co.

Fifty-third Detailed Annual Report of the Registrar-General of Births, Deaths, and Marriages in Scotland (abstracts for 1907). Glasgow : James Hedderwick & Sons.

Report of Royal Commission on the Poor Laws and Relief of Distress : Majority and Minority Report. London : Wyman & Sons. 1909.

Report of the Vice-Regal Commission on Poor-Law Reform in Ireland. 3 vols. Dublin : Alexander Thom & Co. 1906.

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- ABERDEEN, COUNTESS OF: *Ireland's Crusade against Tuberculosis*. 3 vols. Maunsell & Co. 1908 and 1909.
- ABERDEEN, COUNTESS OF: Literature published by the Women's National Health Association of Ireland in reference to Infantile Mortality.
- BUDIN, PIERRE: *The Nursling*. English translation by W. J. Maloney. London: The Caxton Publishing Company. 1907. 21s. net.
- BYERS, SIR J. W.: *Address on Obstetrics*, delivered at the Seventy-seventh Annual Meeting of the British Medical Association, in Belfast, July 1909. London: British Medical Association Office. 1909.
- BYERS, SIR J. W.: *Public Health Problems*. Belfast: William Mullan & Sons. 1906.
- HALL, W. C., and PRETTY, A. H. F.: *The Children Act*, 1908: Being the third edition of the Law Relating to Children, with Notes and Forms. London: Stevens & Sons. 1909.
- NEWMAN, GEORGE: *Infant Mortality: A Social Problem*. London: Methuen & Co. 1906. 7s. 6d. net.
- PARR, R. J.: *Beyond the Law*. London: Published at the National Society for the Prevention of Cruelty to Children, 40, Leicester Square.
- PARR, R. J.: *The Baby Farmer*. London: Published at the National Society for the Prevention of Cruelty to Children, 40, Leicester Square.
- PFAUNDLER, M., and SCHLOSSMANN, A.: *The Diseases of Children*. English translation by Shaw and La Fétra. 4 vols. Philadelphia and London: J. B. Lippincott. 1908.
- WEBB, S. and B.: *The Break-up of the Poor Law*: Being Part One of the Minority Report of the Poor Law Commission. London: Longmans, Green & Co. 1909.

APPENDIX XI

To illustrate Chapter XI

SOCIAL workers should always communicate with the Medical Officer of Health of their district, and, through him, seek to get into direct communication with organizations working for the protection of infant life.

The following official publications may be consulted with advantage :

The Infant Life Protection Sections of the Children Act, 1908.

The London County Council (General Powers) Act, 1908 (section 6), and the Health Visitors (London) Order, 1909, of the Local Government Board, making Regulations thereunder.

The Midwives Act, 1902, and the Rules framed under section 3 (1) by the Central Midwives Board.

The Notification of Births Act, 1907.

See also *Annual Report of the Medical Officer of Health of the Metropolitan Borough of St. Pancras for the Year 1906*, article on 'Progress in the Prevention of Infantile Mortality.'

Consult *Reports of the Proceedings of the National Conference on Infantile Mortality*, June 1906, March 1908. London : P. S. King & Co.

The following works are worthy of study :

ALLISON, T. M. : *Health in Infancy*. London : Simpkin, Marshall & Co. 1s. net.

KANTHACK, E. : *The Preservation of Infant Life*. London : H. K. Lewis. 1907. 1s. net.

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APPENDIX XII

To illustrate Chapter XII

MANY articles dealing with the moral aspects of Infant Life Protection lie scattered through recent periodical literature, and several references to the subject are to be found in recent official reports and the annual records of many medical officers of health. In studying the subject a wide outlook is necessary.

The following will be found of service for purposes of reference :

- ALDEN, M.: *Child Life and Labour*. London: Headley Bros. 1908. 1s. net.
- ASHBY, HENRY: 'Ante-natal Nurture and Physique,' *Lancet*. Vol. II., 1904.
- BALLANTYNE, J. W.: *Manual of Ante-natal Pathology and Hygiene*. Edinburgh and London: William Green & Sons. 1902.
- BOOTH, C.: *Life and Labour in London*. London Macmillan & Co. 1900. 5s. net each vol.
- BOSANQUET, H.: *The Family*. London: Macmillan & Co. 1906.
- BUDIN, PIERRE: *The Nursling: The Feeding and Hygiene of Premature and Full-term Infants*. Translated by W. J. Maloney, M.B. London: Caxton Publishing Co. 1907.
- CADBURY, E., and SHANN, G.: *Sweating*. London: Headley Bros. 1907. 1s. net.
- CADBURY, E.; MATHESON, M. C.; and SHANN, G.: *Women's Work and Wages*. London: T. Fisher Unwin. 1906.
- CANTLIE, J.: *Physical Efficiency*. London and New York: G. P. Putnam's Sons. 1906.

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- DUTTON, A. S.: *The National Physique*. London: Baillière, Tindall & Cox. 1908.
- GORST, SIR J. E.: *The Children of the Nation*. London: Methuen & Co. 1906. 7s. 6d. net.
- HELME, T. ARTHUR, M.D.: 'The Unborn Child: Its Care and its Rights,' *British Medical Journal*. Vol II., 1907.
- HILL, O.: *Homes of the London Poor*. London: Macmillan & Co. 1883.
- HOBSON, J. A.: *Problems of Poverty*. London: Methuen & Co. 1905. 2s. 6d.
- HUNTER, R.: *Poverty*. London: Macmillan & Co. 1904. 6s. 6d. net.
- JOHNSTON, J.: *Wastage of Child Life*. Manchester: John Heywood. 1908. 6d.
- KELYNACK, T. N.: 'Infant Life Protection,' in *Report of the Proceedings of the Third International Congress for the Welfare and Protection of Children*. London: P. S. King & Son. 1902. 2s. 6d. net.
- MCCLEARY, G. F.: *Infantile Mortality and Infants' Milk Dépôts*. 1905. 6s. net.
- MCCLEARY, G. F.: 'The Influence of Ante-natal Conditions on Infantile Mortality,' *British Medical Journal*. Vol. II., 1904.
- MALINS, E., M.D.: 'Some Aspects of the Economic and of the Ante-natal Waste of Life in Nature and Civilization,' *The Journal of Obstetrics and Gynecology of the British Empire*. Vol. III., No. 4., April 1903.
- MONEY, CHIOZZA, L. G.: *Riches and Poverty*. London: Methuen & Co. 1906.
- NEWMAN, G.: *Infant Mortality: A Social Problem*. London: Methuen & Co. 1906. 7s. 6d. net.

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- PATON, NOEL: 'The Influence of Diet in Pregnancy on the Weight of the Offspring,' *Lancet*, Vol. II., 1903.
- REASON, W.: *Poverty*. London: Headley Bros. 1909. 1s. net.
- RENTOUL, R. R.: *Proposed Sterilization of Certain Mental and Physical Degenerates*. London and Newcastle-on-Tyne: Walter Scott Publishing Co. 1903. 1s. net.
- ROWNTREE, B. SEEBOHM: *Poverty: A Study of Town Life*. London. 1901.
- SALEEBY, C. W.: *Parenthood and Race Culture*. London: Cassell & Co. 1909. 7s. 6d. net.
- SCHARLIEB, M.: 'Alcoholism in Relation to Women and Children' in *The Drink Problem*. Edited by Dr. T. N. Kelynack. London: Methuen & Co. 1907. 7s. 6d. net.
- SHADWELL, ARTHUR: *Industrial Efficiency: A Comparative Study of Industrial Life in England, America, and Germany*. London: Longmans. 1906.
- SIMS, G. R.: *The Black Stain*. London: Jarrold & Sons. 1907. 1s. net.
- SPARGO, J.: *The Bitter Cry of the Children*. New York and London: Macmillan & Co. 1906.
- SPENCER, M.: *Social Degradation*. London: Student Christian Movement. 1908. 1s.
- TAYLOR, J. W.: 'The Diminishing Birth-rate and What is Involved in it,' *British Gynecological Journal*. Vol. XX., 1904.
- WHETHAM, W. C. D. and C. D.: *The Family and the Nation*. London: Longmans, Green & Co. 1909. 7s. 6d. net.

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